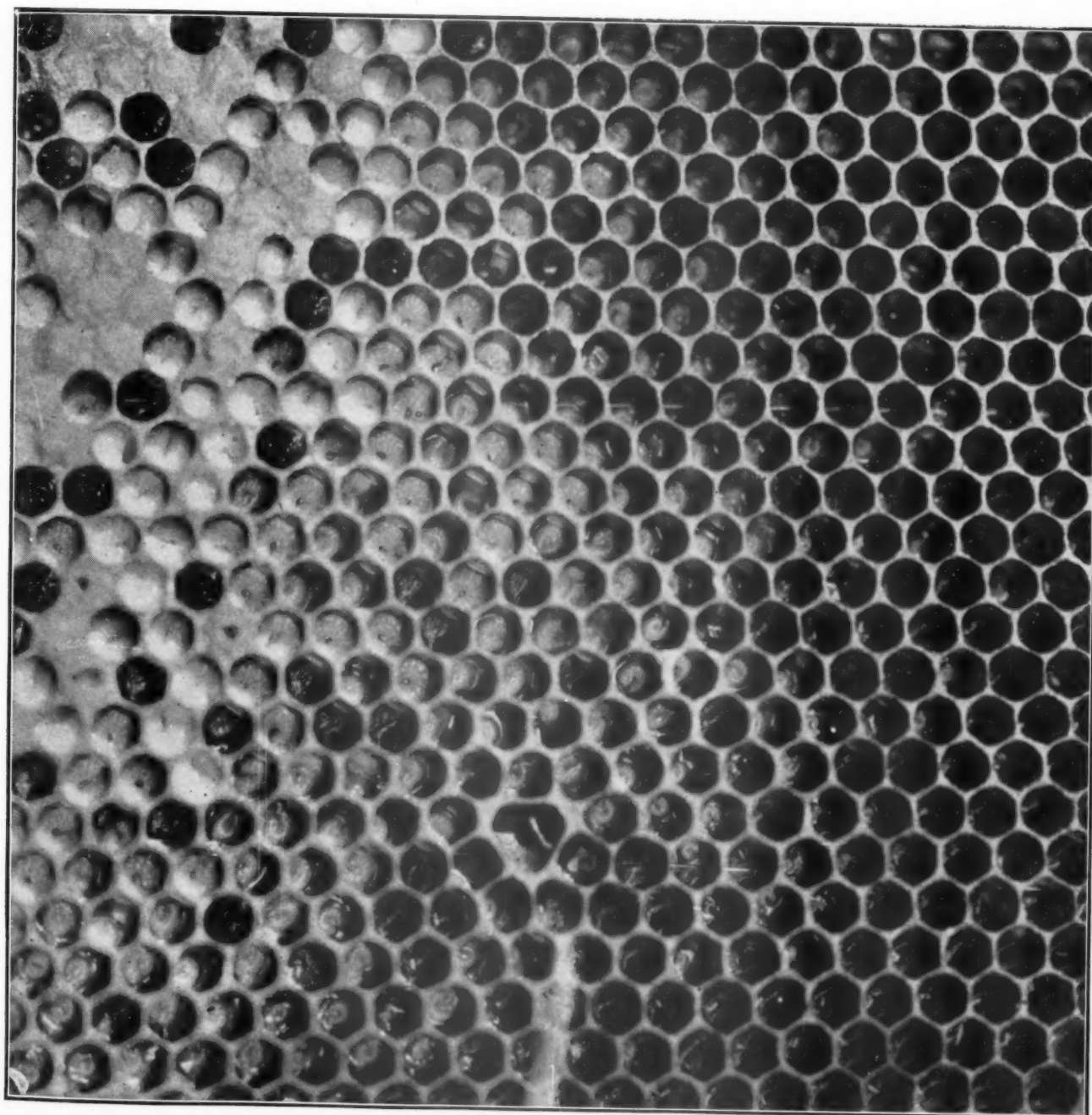


AMERICAN BEE JOURNAL

SEPTEMBER, 1918



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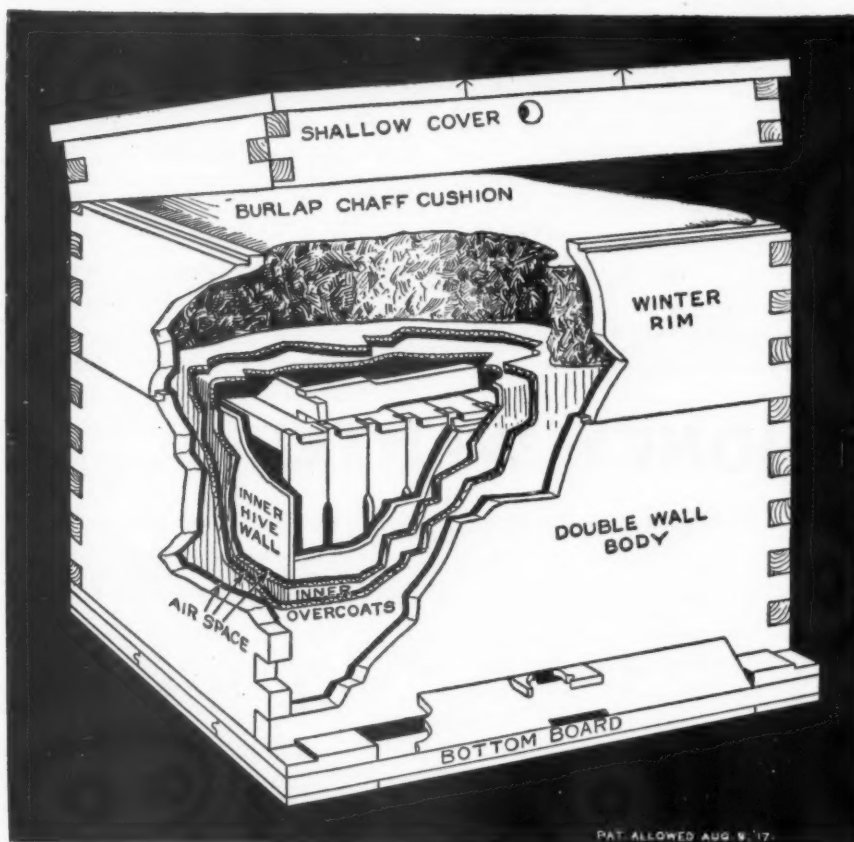
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VOL. LVIII—NO. 9

HAMILTON, ILL., SEPTEMBER, 1918

MONTHLY, \$1.00 A YEAR

GLIMPSES OF SOUTHWEST TEXAS

Beekeeping Conditions in the Semi-Arid Region Where Every Bush has a Thorn,
as seen by Frank C. Pellett.

TEXAS seems to be divided into several natural regions, from the standpoint of the beekeeper, as already mentioned in a previous article. San Antonio is near the northeastern border of the mesquite region. Mesquite is plentiful for a long distance north of that city, but near the northern boundary of Bexar county is the line where cotton begins to yield honey in surplus quantities. Accordingly that territory must be regarded as in the natural division where cotton is the predominant honey plant. A line drawn in a southeasterly direction from San Antonio, through Cuero

and Victoria to the gulf, would probably mark the approximate eastern boundary of the mesquite region. Figure 1 shows a characteristic group of the southwestern honey plants at Goliad. Here are seen agarita, mesquite, hackberry, Mexican persimmon, brazilwood, anaqua, prickly pear and huisatche; all good honey plants, growing together in one group. At Victoria, in the next county and only about thirty miles away, we find a very different flora. Agarita is common at Goliad, but is absent at Victoria. Victoria is about the eastern limit of mesquite at that point. Anaqua is still to be

found in limited quantity, but the flora is, for the most part, the same as common to other parts of east Texas. It is surprising what a change one finds in the flora in such a short distance. After finding the thorny flora of the southwest for a continuous stretch of about two hundred miles, one is not prepared for such a sudden change. The natural boundary of this region is not difficult to find. The escarpment between San Antonio and New Braunfels distinctly marks the northern boundary, while the river at Victoria is almost as clearly the eastern boundary. The Rio Grande valley marks the south and west boundaries.

It is in this region that commercial beekeeping has reached the highest development in Texas. In some counties one finds more commercial beekeepers than in whole States in other sections of the country. Instead of getting honey from cultivated crops like cotton or clover, the beekeeper is dependent almost wholly on the wild flora for surplus. Beekeepers report that wherever the land is cleared they find it necessary to move their apiaries, as none of the cultivated crops common to this section yield honey in surplus quantity. Even cotton is of little value on the light soils of this part of Texas.

Most of the honey comes from thorny shrubs, such as catclaw, hualillo (pronounced waheya) and mesquite. The soapbush has the appearance of an evergreen shrub, and is able to withstand the most severe drought. It is reported as yielding from ten to fifteen days during its period of bloom.

One marked peculiarity of the plants of the southwest is the uncertainty of the time of blooming. In



Fig. 1 A clump of southwestern honey-plants at Goliad, Texas. Aganta, mesquite, hackberry, brazilwood, anaqua, prickly pear and huisatche; all good honey-plants growing together

the northern States the beekeeper can anticipate approximately the time of his honeyflows and prepare accordingly. In the southwest, the blooming periods are likely to occur at almost any time, depending upon the weather. The soapbush blooms after the rains in both spring and fall, and the time of the rains will thus determine its time of bloom. Whitebrush is an important source of honey over much of this part of Texas, and it is said to bloom several times during the year, in favorable seasons, always following the rains. Should the season be dry throughout, it will yield no honey, while in seasons when there are frequent rains it will yield several times in the same year.

At Goliad, the Collier brothers have about a thousand colonies of bees. They report that brazilwood is the

Southern Kansas. It is not dependable every year, but is abundant following wet winters. The moisture serves to germinate a new crop of seed. In the Rio Grande valley it is reported as sometimes yielding as much as 20 pounds surplus per colony, average. The importance of the plant seems to increase as one moves northward. The time of bloom is reported as varying in different parts of the State. Several beekeepers mentioned horsemint honey as having a tendency to ferment in wet seasons. Unless great care is used in ripening, the beekeeper has trouble after the honey is in the cans. A few cases were reported where it even soured in the combs.

This part of the southwest is deficient in rainfall. Most of the plants on which the beekeeper depends yield with but little rain. A light

shower is all that is necessary to bring some of them into bloom. It sometimes happens, as was the case last year, that the flora remains dormant to the extent that little bloom is open. Then bees suffer severely. In 1917-18 the losses were from 25 to 75 per cent in many counties in southwest Texas. The losses were most severe at a distance from the streams, where the upland flora furnished the entire dependence. The most serious feature at such times is the shortage of pollen. At some points in the western portion of the mesquite region, the bees were unable to continue brood-rearing when fed with sugar syrup, and swarmed out and left the hives in large numbers. Along the streams where some pollen was available, the losses were much lighter, and in some cases there were none.

At some points along the Nueces river, there was a secretion from live oak balls which saved the bees in 1917. George Schmidt, at Crystal City, reports this as occurring in dry seasons. He thinks his bees gathered an average of 25 pounds per colony from this source in 1917, most of which was used to carry them through. He took off ten cases of this live oak honeydew. It was amber in color, very thick, and tasted strongly like molasses.

There is a great variation in the yield of honey in different parts of the mesquite region. In some localities the beekeepers are unable to secure more than twenty-five pounds as an average surplus, one year with another. In other places, they report that in a normal season they get 100 pounds per colony. The estimates of yield differ with different localities, from 25 to 100 pounds.

A few miles often make a great difference in the yield, depending upon the local showers of the season. At Sabinal one man, J. A. Simmons, has eleven yards. The extremes are



Fig. 2. The soapbush is able to withstand severe drought

best all-round source of honey in their locality. It blooms sometimes in spring, sometimes in fall. Some years it blooms several times and yields at irregular periods. Mesquite also blooms at two or more periods during summer. The cactus or prickly pear, which is so common everywhere in the southwest, is valued especially for pollen. Its period of blooming is reported as more regular. Beginning in July, it blossoms for four to six weeks. About one year in four it yields some surplus honey, but the flow is usually very short, continuing but four or five days. The honey is peculiar in appearance, granulating in large crystals in clear liquid. It is often spoken of as buttermilk honey, because of this peculiarity. E. G. Le Sturgeon reports one year an average yield of 87 pounds per colony from prickly pear in Atascosa county.

Horsemint is found in every part of Texas which I visited. It is regarded as an important source of nectar from the Rio Grande valley to



Fig. 3. A typical native flora where the cactus and mesquite grow in abundance

only thirteen miles apart, yet he never gets a full crop in all of the yards in the same year. Every year some locations will get showers which do not occur in others, with the result that the yield will be much increased. In the rare seasons when the rainfall is well distributed throughout the year, the honey-flows in this region are wonderful.

In 1900, at Mathis, there was a flow from catclaw in March, followed by huajillo. In May there was a good flow from mesquite, and in June and July a very unusual flow from cotton. There was a further flow from plants that rarely are of value.

For several years following this favorable season commercial beekeeping was an important industry about Mathis. The past two years, with no honey, have proved so disastrous that nearly all the beekeepers who depend exclusively upon the business have moved out. It is very probable, however, that seasons of great abundance will follow the lean years, and thus equalize things, after all. Wm. Atchley was the last of the extensive honey producers remaining at Mathis, but he was preparing to go shortly unless conditions changed. The bees were finding it so hard to maintain themselves, even with enormous amounts of sugar, that it seemed impossible to continue safely.

There are few places in America where beekeeping has attained the importance that it holds in southwest Texas. In towns like Beeville and Uvalde they talk about bees and honey as they do corn and hogs in Iowa or Illinois. Under normal conditions a good many cars of honey will be shipped from a single town. The public has a proper appreciation of the commodity that brings in the cash for conducting the business of the community. In Alabama it is cotton, in Iowa it is corn. California oranges and raisins are exchanged for perfectly good money in east-

ern markets. In southwest Texas honey is one of the leading cash crops. The two years drought has hit the beekeepers and the country generally pretty hard, but other sections and other industries hit the bottom at times. Beekeeping is on too firm a footing to suffer permanently from a bad season. There are a good many men who have upwards of a thousand colonies of bees under normal conditions and who consider less than a carload of honey a short crop.

Apicultural Don'ts

By D. M. Macdonald

DON'T tinker with Inferior Bees. Most cheap articles are dear in the end. Poor, mongrel bees cost as much to house as those which may be called first class. They

are as costly to start when furnishing the new home. Frames, brood foundation, the wire, the process of inserting, fixing and wiring, cost the same. The result of the first season's work in the one case is generally all that could be desired, in the other, comb construction is poor in quality and frequently proves defective, then and for all time. Poor bees often propolize over much, thus causing the workers needless labor and imposing on their keeper worry which proves a heavy tax on his temper when manipulating, and not conducive to good temper in the bees. Mongrels are almost invariably cross-tempered. At the end of the season with the good bees, bumper crops of well-finished, shallow frames or sections are all but a certainty. The poor bees, in nine cases out of ten, at least, give poor returns, and that of poor quality and defective



Fig. 4. Group of beemen at Beeville



Fig. 6. A group of beemen in the Edwards apiary at Sabinal

finish. The first will give several crates, the others will lag far behind. Packing for winter is a pleasure with the best bees. Every colony has strong forces, ample stores, and many newly-hatched bees. In the other case few bees, a poor cupboard, and too many aged workers make wintering a doubtful asset. Keep the best bees, in the best way, packed with the best winter packing—bees.

Don't Keep Low Grade Queens.—This point is not quite on all fours with the previous don'ts. The same, or somewhat similar results, may occur here again, but there are added drawbacks. A queen guaranteed to lay 50,000 eggs in the time a weakling takes to lay less than half that number gives the population an enormous pull over the inferior one. The results are not in proportion to mere numbers alone. The strong one will not only have double the population, but will present its owner with at least four times the surplus, a point well worth considering. Its work, too, will be more highly finished, be

completed in far less time, and approach nearer to perfection. On account of the larger numbers the strong colony will forage earlier in the forenoon and keep up work later in the afternoon than the laggard. They will go farther afield, thus frequently obtaining richer forage grounds, and they will make flights to the bee pastures on days when the other remains indoors. They will manufacture wax quicker, build comb more expeditiously, and seal stores with less trouble and greater speed. The weakling will worry carrying propolis to glue up every corner in case of draught, the powerful can sustain internal heat without any trouble. Then, as a matter of fact, the strong actually consumes less stores relatively, or at times actually, than the small number. The cause is patent.

Don't Manipulate Out of Season.—Bees are best left alone for about half the months in each year. Winter is a season of repose in the hive interior. Bees exist then in a state of semi-hibernation. Every ounce of calorie-generating food consumed as a result of disturbance is not only needlessly wasted but it acts injuriously, for the agitation begot in the cluster tends to weaken and prejudicially affect the digestive system. To restore the temperature of the disrupted cluster, food must be consumed, and the bees may be forced to take untimely flights to void their feces. In general, the caution applies to too late examinations in autumn and too early inspections in spring. Any attempt at late feeding to remedy defective stores or early stimulation to start untimely breeding, works evil and not good. "Jumping" the frames, your equivalent of our phrase "spreading the brood," in early spring, causes mischief. Opening hives when weather is cold or when a chill wind is blowing, is a blunder which may destroy brood and drive workers from the supers.

Don't Buy Cheap Articles.—Cheap

and nasty are often synonymous terms. A cheap second-hand hive may ultimately turn out a dear one. A novice should never be beguiled into investing in colonies offered "at an old song," because an odd sized hive may be dear at any price, as none of its parts are interchangeable with other hives in your apiary. No worse investment can be made by the beginner in apiculture. Even a parson may be guilty of thus beguiling the unwary. Purchase your bees, if possible, from a near neighbor, a man of probity, on whom you can rely, or treat with an appliance dealer of repute. Such men have to obtain and sustain a good name. Be prepared to give a good price for a good article, the regular market price being a safe guide.

Don't Forget the Profits.—The laborer is worthy of his hire. Some of my hives gave me profits of from £4 to £5 last season, and certainly the pleasures and joys of beekeeping were not lessened by the total drawings being relatively high. Honey has been in abnormal demand. Profits are considerably enhanced when careful saving is practiced. Purchase only what appliances are actually necessary to run your apiary. Be economical without being parsimonious. Encourage no waste. Collect and preserve every particle of wax, and at a convenient season melt it into cakes. Discard no frame that is not really defective, and don't throw away pieces of comb, especially if they are constructed of worker cells. Special care should be taken of all shallow surplus combs from year to year, and of all brood frames not covered by the bees during the winter. In countless ways similar care may be given to tools and appliances, thus doubling, it may be their total existence, thereby raising the balance on the credit side at the conclusion of each honey season.

Don't Value Apiculture for Profits Alone.—M. Maeterlinck practically but graphically strikes the right key-

note in regard to the pleasures of beekeeping: "For one who has known, studied and loved bees, a summer without them would be like one without birds and flowers." The writer felt the force of this the season when disease wiped out his apiary. At last a happy thought dawned on him, that if the mountain could not come to Mahomet, he could go to it. Perforce, as if drawn by a lodestone, he was drawn to the bees, and in no other season were so many outside apiaries visited. The study of the bee itself, its customs, habits, government, prescience, wisdom; its anatomy and physiology, form a most delightful pastime, and is well worth the interest and devotion of even the beekeeper to whom honey getting means bread and butter. The joys of beekeeping are manifold. What can be more delightful than watching the wild gambols of a first flight in spring, the brilliant evolutions of a swarm, the observation of multitudes of bees carrying in all colors of pollen, the steady stream of workers bringing home heavy loads of the nectar which later is converted into sweet, luscious honey?

Don't Keep Bees Without the Journal.—It should be a guide, philosopher and friend to everyone who wants to keep up with all that is latest and best in apiculture. Indeed, I feel the veteran reads it as diligently as the novice, and derives even more pleasure from its perusal. In countless ways it helps lame dogs over stiles. Its news of beedom must be invaluable to all. Dr. Miller's Answers alone are worth the actual cost of each issue. The editor's reviews, summaries, criticisms and articles, short or long, are all of great excellence. Many years ago it was known as the "Old Reliable," and this descriptive sub-title is as appropriate today as ever it was. Each successive year it renews its youth. Outside it is a thing of beauty; inside it is a joy forever. To the novice I would advise that he should make a thorough study of the articles named in the index every December, and devote any spare winter evenings to a re-perusal of those most interesting to him. The results must make him a better beekeeper. Let him read, meditate and inwardly digest; then his labor in future should prove lighter and his results more profitable, because of the acquired knowledge gleaned from wiser heads than his own.

Don't Forget a Good Text Book.—Even before investing in hives or bees the man meditating a start in apiculture should purchase one or more good bee books. The writer, after reading almost every work on bees, ancient or modern, is inclined to place "Langstroth on the Honey-bee," Twentieth Century edition, and Root's latest issue of the "A B C and X Y Z" amongst the first half dozen. From the time of Virgil and Aristotle, that is before the Christian era, men have studied bees and written bee books. From then on there has been a long succession of more, or less brilliant writers, and we of this

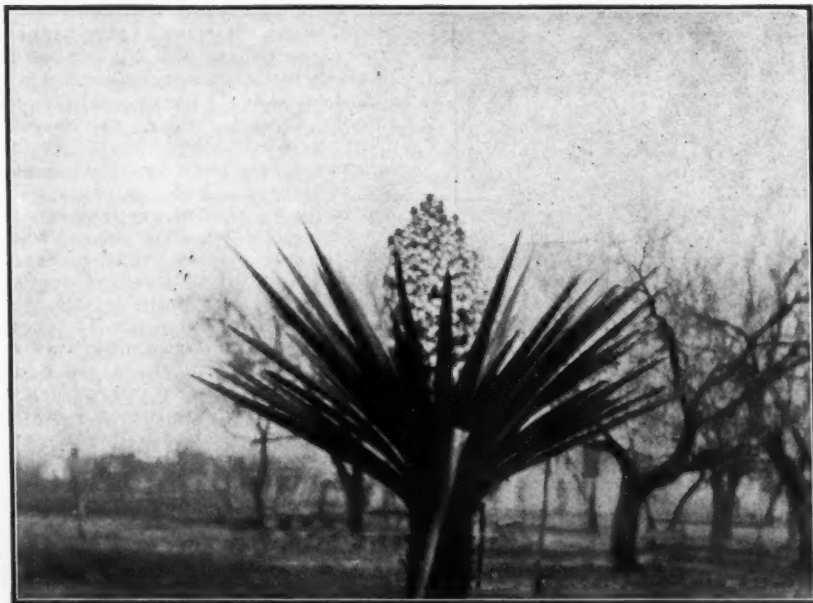


Fig. 6. The Spanish bayonet is a showy plant of tropical appearance

century reap the benefits of their labors. Authors of our time, while discarding the myths and errors of the past, the chaff, have conserved the good grain, and have added to that the marvelous discoveries of more recent years from Huber's and Langstroth's time until now. Remember the best beebooks of today contain the essence of the wisdom of many generations of "live" beekeepers and the discoveries of more than 2,000 years of patient toil

Bauff, Scotland.

Legalizing Co-operative Marketing

By Chilton Gano

CO-OPERATIVE marketing, in its best sense, means more than the mere banding of farmers together as an ordinary corporation. The ordinary corporation is financed by the sale of stock and must pay dividends on its capital. Its earnings thus go to members in proportion to their stock holdings, regardless of whether they actually do any business with the organization or not. Such a marketing company is apt to get along without any friction only when members actually hold amounts of stock which correspond in relative size to the business they do with the association. That is, if Farmer Smith's honey represents one-tenth of the entire amount sold by the association in a season, his stock in the corporation should represent one-tenth of its total capitalization.

But this is highly impracticable in practice, for his output this year may be one-tenth of the whole, and next year it may be one-twentieth. Yet next year he pockets one-tenth of the profits, just the same.

In ideal co-operative organizations man-power, not money-power, is what counts. That is why many States have passed co-operative laws authorizing the incorporation of new kinds of corporations which either have no capital stock whatever, or if they do have capital stock pay only a fixed annual interest on such stock instead of regular dividends. The earnings of such co-operative corporations are then apportioned back to the members in proportion to the amount of business transacted with them in the season. In other words, such organizations operate at cost, and all profits go back to the members.

The California laws permit of co-operative associations without any capital stock whatever, and most of the orange and lemon growers' associations are non-capital-stock in form. This form of organization is probably the broadest possible in principle. Members are allowed to make their own by-laws covering financing, voting power, conditions of membership, transfer of membership, etc., yet their association ranks as a corporation.

The big problem where there is no

capital stock is how to get the money to start up. In California the banks know such organizations are good risks, and they usually start on money borrowed on a corporation note, which is gradually repaid from the earnings of the organization.

Where the banks are not favorable, money to build a packing plant can be secured from the members by assessment, according to their acreage or expected crop or average annual crop.

Such associations usually charge a membership fee, either of a fixed amount or graduated according to the acreage or crop of the applicant.

Another Type

The California laws also permit another form of farmers' organization, which sells capital stock but pays earnings in part back to the members according to business transacted. This form of co-operative organization is that most often apprehended by the term. They either pay a fixed interest on capital stock annually, or they pay an initial fixed price to the growers on their crops or product, then devote a fixed amount per crop unit above this to operating expenses and dividends on stock, and then pay back any surplus above this which may be obtained to the farmers according to business transacted. The California Associated Raisin Company is of this type, paying 3 and a fraction cents to the growers on delivery of raisins, taking so many cents per pound from the selling price as their operating margin, and refunding any further surplus to the growers.

Nebraska, Wisconsin and several other States have co-operative laws authorizing this form of co-operation, but have no non-capital-stock associations.

Some of these States very rigidly define how profits shall be divided, whether the members shall have one vote each or vote according to acreage or other standards, etc.

The Texas co-operative law is of particular interest to honey producers just now because of the recent success of the Texas Honey Producers' Association. The Texas law is just a little more than a year old. In simplicity and latitude given to the associations for managing their own affairs, it compares favorably with the California law. Its principal provisions are:

That co-operative associations shall be purely local in character, in no event to extend beyond a reasonable area surrounding a town, but that they may federate with other similar associations of other towns.

That such associations shall be non-profit, passing their profits to a surplus fund or dividing their profits among members in proportion to the respective cash contributions to working capital and patronage.

That associations shall have property of not less than \$500 value, which may be cash, property or notes.

That the association shall have the

right to act as the co-operative selling and purchasing agents of their members only, and, may, for their members, sell any and all agricultural crops, and buy machinery, supplies, insurance, and other needs.

That the members shall not be liable to the corporation or its creditors in excess of the membership shares subscribed by them, unless in the by-laws the members are made responsible for an additional amount equal to 100 per cent of membership shares owned.

Look to the Law

Farmers planning to sell co-operatively should by all means take steps to secure proper State legislation, unless it already exists or unless they can incorporate under the co-operative law of another State and then enter their own State as a foreign corporation. Such a roundabout procedure is often resorted to by regular business corporations, and would no doubt be practicable in some instances for co-operative associations. However, legal technicalities might make it impossible, in some States, and expert legal advice should, of course, be had in every case.

The simplest way, however, in the long run, would, no doubt, be to select the form of co-operative law desired and assure its passage in the State legislature. The growing list of States which are adopting such laws indicates in general that they are good laws to have, and farmers would ordinarily, just as a matter of pride, prefer to be incorporated under the laws of their own State.

The writer would suggest that the California law is excellent in every way and a good one to copy after, when in doubt. It has proved adequate to the needs of the world's greatest co-operative marketing associations, those of the Sunkist Orange Growers and Sun-Maid Raisin Growers—indeed, has helped to foster the growth of these great federations of farmers, with hardly a question, because of its broad scope and the freedom it permits them in minor matters.

Chicago, Ill.

Bee Laboratory at Ames.—The Iowa State College at Ames, has recently appropriated \$1,200 for fitting up a beekeeping laboratory in the basement of the new science building. There will be ample floor space for the bee work and all modern conveniences, including hot and cold water. Gas and electricity will be installed. There will be four rooms in all. The largest room will be used for the usual laboratory purposes. One will be fitted up for a wintering cellar, one for a honey and wax room, and the fourth will be utilized as an exhibit room. Professor F. Eric Millen, who has charge of the work at the Iowa College, is rapidly extending the work of his department, and new quarters are necessary.



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IMPORTANT NOTICE

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THE EDITOR'S VIEWPOINT

Transferring From
Box-Hives

Bulletin 961 of the U. S. Department of Agriculture on the above subject is at hand. This is one of the most useful publications ever issued by the Department, for the reason that there has been more waste in this matter of transferring than in any other question concerning beginners. This Bulletin is most important in instructing beekeepers who are not yet using the modern methods, but who have kept bees in boxes or gums. This Bulletin should be distributed freely among them.

The different methods of transferring are also very necessary where bees have been in modern hives without the necessary guides to secure straight combs in the frames. A hive with movable frames in which the combs are crooked and run from one frame to another is much worse than a box hive for any manipulation, and is also more difficult to transfer. Let all those who are troubled with crooked combs or have bees in box hives send for this Bulletin.

European Foulbrood

"The Control of European Foulbrood" is the title of Bulletin 975 of the United States Department of Agriculture. This is by Dr. E. F. Phillips, and, like everything that comes from his pen, is practical and to the point. European foulbrood was designated "bacillus pluton" by Dr. White, the bacteriologist whose studies of bee diseases are now accepted as authoritative and conclusive by scientists the world over. The name "European" was given only to differentiate it from the rosy foulbrood which was called "Ameri-

can," but both diseases undoubtedly exist on both continents.

By securing this Bulletin, together with Bulletin 442, "The Treatment of Bee Diseases," by the same author, Dr. Phillips, 1911, the beekeeper will have the benefit of all the knowledge of the subject acquired in the past 15 years through experiments and the gathering together of information at our Capital.

Another Bulletin, No. 671, just now appearing, has been delayed by an error in the transposition of two cuts, illustrating the appearance of combs containing larvæ dead of European and American foulbrood. This Bulletin is entitled "Diagnosis of Bee Diseases by Laboratory Methods." It is by A. H. McCray and G. F. White. It will interest the bee inspectors and the better informed class of beekeepers. It gives short and pointed statements on the characters of European and American foulbrood, on sacbrood and on Nosema apis. The reputation of the authors vouches for the correctness of the statements.

International Fraternity
of Beekeepers

It is out of the province of a bee magazine to touch the present burning question which is constantly in the thoughts of every human being. But the flood of enthusiasm which reaches us in the shape of numerous private letters from across the seas needs public acknowledgement. For this reason, we give place in our columns to a short, typical letter, not written for publication, but so expressive of the popular sentiment among our allies that we feel sure its author will pardon us for giving it

publicity. It is from no less a man than the editor of the oldest existing bee periodical in the world:

"Mr. C. P. Dadant:

"Dear Sir.—At the time when your brothers and your sons are with us, mingling their valiant blood with that of the French, for the defense of right and liberty, I, who have had already terrible trials, cannot help thinking of the American fathers, mothers and wives who have dear ones every day exposed to death or wounds. I feel how much my anxiety would be attenuated if, in a similar situation, I knew that there were near the loved ones some tender-hearted friends who would bring them, whether wounded or healthy, a little enjoyment. Near a friend, they would recover a touch of the family life.

"For this reason, permit me to say to you, dear sir, that if you have a relative, a friend, in this war, write him that he will find in my home a family who will try to help him forget for a few moments the remoteness from his own people, so painful to the one who is fond of family life.

"Please accept, my dear sir, my heartiest good wishes.

"M. SEVALLE,

"Editor of L'Apiculteur,"

"Paris, France, July 7, 1918."

Hundreds of similar letters have come to us across the seas, from heroic, bleeding France, from unrelenting Great Britain, from warm-hearted Italy, as well as from smaller allies and neutral countries like Switzerland. But none of them express their hearty good-will any better, or in more concise words, than the above.

Our hearty thanks are extended, in the name of American beekeepers who have sons at the front, for those numerous friendly offers as well as for the warmth and enthusiasm expressed towards our Nation.

Fellow-Americans, whether you are beekeepers, farmers, mechanics, professional men or merchants, you are building, perhaps better than you realize, a wonderful brotherhood with the rest of the human race. The lavish manner in which the Star-Spangled Banner is pouring into the conflict her money, her food, her blood, for the defense of an ideal and the crushing of the most ruthless militarism since the days of Attila, will remain to her credit for centuries to come. Neither should we forget that, aside from a few traitors, there are among us thousands of descendants of the Central Powers who are doing their duty to the country of their adoption with as much patriotism as any of us.

When ruthlessness is crushed and peace again comes, let us hope that

we may see international compacts between all the nations! May I live long enough to attend an international congress of beekeepers, in which all ill-feelings will be forgotten and the countrymen of Huber and Bertrand, of Cheshire and Cowan, of Girard and Bonnier, of Maeterlink and Wathelet, of Barbo and Visconti, of Kandratieff and Zoubareff, of Berlepsch and Dzierzon, of Langstroth and Quinby, will meet to discuss their interests, their discoveries and their methods, establishing a "Sainte Alliance" of honey-producers.—C. P. D.

Honey in New South Wales

A. Shallard, in the Australasian Beekeeper for June, page 230, writes: "The speculators are holding 1,300 tons of honey in Sydney, and the beekeepers are crowded out of the ships by them. We should have precedence. Fight for it."

The inability to ship honey across seas is helping enhance the price in Europe. When transportation is released, after the end of the war struggle, there will be a great readjustment of prices in all sorts of produce. Keep it in mind.

Iowa State Apiarist Report

The printed report of F. Eric Millen, State Apiarist of Iowa, for 1917, is before us. It is a book of 89 pages, containing a short statement by Professor Millen, as to the work accomplished during the year under his supervision, a copy of the State law on beekeeping and diseases, and copies of the different addresses delivered at the State Beekeepers' Convention held in Des Moines December 4 and 5, 1917.

Professor Millen gives great praise to his predecessor in the State Apiary work, Mr. Pellett. We can assure the beekeepers that Mr. Millen himself is also a worthy worker, and that Iowa was fortunate in securing his services. Iowa beekeepers can secure this work by joining the State Association. Address Professor Millen at Ames.

"Queen" or "Mother Bee"

By Robert Sparks Walker
Editor of the Southern Fruit Grower

SINCE we have been engaged in the world war we have discovered in our own midst many things un-American and undemocratic. In addition to the task of the Americans at home to back up our gallant men at the front, we must

also work faithfully to thoroughly Americanize America.

It is not believed by the best thinkers today that democratic nations would go to war. But from history we have learned that countries ruled by kings, queens, dictators, emperors, sultans, etc., have brought many bloody wars, until the world has, almost as a unit, condemned such forms of government, and it is a great day for the world that such has been the case. To Americans the names "King," "Queen," "Emperor," etc., will ever be held in contempt. Henceforth, no fruit, or any product, can be named or designated by these words and carry with it the suggestion of a high quality. So every name that is un-American and which will bring contemptible utterances should be forever stricken from our vocabulary.

For this reason, I am in favor of immediately changing the name of the "Queen" bee to that of the "Mother Bee." In fact, I move the beekeepers of America today that the change be made.

This bee now merits a better name, and the sweetest and best name in the English language is "mother." There is no other name to equal it, and it is thoroughly American and will strengthen our democracy; whereas, on the other hand, the frequent or rare use of the word "queen" suggests autocracy, the very thing that America and the allies are giving their all to crush.

Chattanooga, Tenn.

This suggestion is quite proper, but there are two obstacles in the way. The first is the long established habit, even in our kingless republic, of calling the only fully developed female of the beehive "queen." The first name given her was "king," because they did not know her sex, and because they noticed the great love of the bees for this large bee and the care with which it was surrounded. It was only in 1609 that Butler, an English naturalist, discovered that she was really a female. But long after that, some authors persisted in teaching the existence of a "king" in the hive. We have before our eyes a book by M. J. Simon, dated Paris, 1758, entitled "La Republique des Abeilles," in which the existence is asserted of both a king and a queen in the insect republic.

Hamet, the founder of the now oldest existing bee periodical, L'Apiculteur, tried ineffectually to change the term of "queen" to that of "mother bee." In his book, "Cours D'Apiculture," he carefully avoided the use of the word "queen." Hamet was an ultra-progressive politician, even though he was a very conservative beekeeper, and after the fall of Na-

poleon III, during the Franco-Prussian war of 1870, he again launched a campaign against the use of the word "queen." But, nevertheless, his magazine, now, many years after his death, is still using the term "queen" promiscuously with that of "mother bee."

The second difficulty in the use of the term "mother" is met when we speak of a virgin queen. We cannot say "virgin mother," for the two words are contradictory. We must then follow Hamet and speak of the unfertilized queens as "virgin females," or "young females." For these two reasons we believe that the word "queen" will remain in popular use.

Human beings are fond of pomp, dignity and ostentation.

That is probably why our Canadian neighbors, who are practically living in a republic, affect a great love and excessive respect for a reigning family which has less political power than our President. Is it not probable that constitutional kings and queens will continue to reign, with constantly decreasing power, but with much respect from their so-called subjects, as long as they live decently and behave in a democratic bourgeois-nobility way, an expensive but ancient institution? If so, we can tolerate the "queen" among bees, for she is certainly a constitutional sovereign, with no power whatever, but with a great deal more usefulness to her people than any king or queen that ever existed, for she is indeed the "mother," and the love with which her bees surround her shows that they appreciate her usefulness.—Editor.

Sugar for Feeding

In response to numerous inquiries, we wrote to Washington to find out just how much sugar the beekeeper would be allowed for feeding his bees.

According to their ruling a full allowance is made for feeding bees. In order to obtain this sugar, you should apply to your local food administrator for a certificate, or in case he lacks it, write to your State Food Administrator.

A peculiar part of this ruling of the department is that it stipulates an allowance of 50 per cent of the amount used during the corresponding period of last year by the **manufacturer of honey**. Why add insult to injury, when the beekeepers for years have been trying to convince everyone that there is no such thing as manufactured honey. The pure food law does not allow it, anyway.

SCIENTIFIC HONEY MARKETING

Facts Which Are Important in Evolving a Plan for Practical Honey Selling

BY NELSON W. PECK

THE first important problem which looms up before most beekeepers is generally that of production. In the solving of this and in the attendant details, so much time and energy are usually consumed that little if any intelligent effort is ever made, except in exceptional cases, toward scientific selling.

Taking for granted that the product in question is of its kind as good as any, whether white clover or buckwheat, raspberry, fireweed, alfalfa, sweet clover, sage, orange or aster, let us turn our attention, while there is yet plenty of time for reflection, to this subject of scientific marketing.

Whenever anyone has any more of anything than he can use himself, whether it is doughnuts or cobblestones, someone, somewhere, always exists who could use it if it can be delivered to him at the right price. The price depends largely upon the quality of the stuff, how much of it there is, and how greatly the consumer needs it, or thinks he needs it. The primary object in scientific marketing is to find this necessary someone, tell him that you have just what he needs and at what price he can obtain it. This process is called advertising. It may be accomplished by flaring notices in conspicuous places, which vex the mind and are read and forgotten and which are expensive and hideous. Or it may be accomplished by vendors or mongers yelling at the top of their lungs, "Extra! Extra!! All about the Blank Murder!!! Or by quiet solicitation from shop to shop and house to house. But no matter how we choose to go about it, some form of this advertising is absolutely necessary and must be accomplished as effectively and cheaply and unobjectionably as possible. Most long-lived business firms have found out that a thoroughly satisfied and enthusiastic customer is the cheapest and best advertisement obtainable. So be it, it's very, very necessary to obtain this first customer and his comrades.

Let us consider profoundly this subject of advertising, one of the oldest arts of Mother Nature herself. Have you ever walked beneath an apple tree at blossom time and smelled the dewy fragrance of the bursting flowers and looked above you into the busy market place among the showy pink and white petals? 'Twas Mother Nature's advertising that reached you; but it was meant for the bees, and the chances are, unless you got out before them, that they were there in numbers long before you. Yes Nature has something for sale, both pollen and nectar, and she proclaims in a quiet but effective manner that the nectar is sweet and plentiful; can't you smell it, and see the great

mass of bloom? Yes, all this is for sale, there is plenty of it, it's good and the price is but a few grains of pollen, which is generally well paid. We can always look to Nature for guidance. She is always before us and about us and her activities are numerous and complex enough to furnish us an inexhaustible source of examples and ideas. Like Nature, we have something for sale, and we should both show its abundant beauty and proclaim its useful attractiveness. We may show it in shop windows and proclaim it by labels and well-worded cards in those windows, or we may show or display it at some house door and proclaim its virtues and usefulness by word of mouth alone. Or, better yet, by both display and word of mouth and sample. The idea of samples is very agreeable and effective and though seemingly expensive often produces results warranting all expense. Is your honey unusually good? What need, then, to blare or bawl it out? Let the good housewife, or, better, the husband, or better yet the children, try it. Their tastes will soon tell them if it is to their liking, and they'll want more. Oh, yes! the label on the bottle tells where they can get it—at So-and-so's grocery.

And just here is the grain of wheat in all this bushel of chaff. Most producers of honey begin their selling efforts at the nearest corner grocery. This is an absurd blunder, which works injustice to the poor grocer, injury to the apiculturist and unfairness to the prospective consumer. Scientific marketing directs its first efforts at the consumer. Find those someones who are looking for just what you have for sale, and don't know it. They will find the grocer all right, don't worry about that, and he will find you. But cultivate the love and kindly respect of the consumer first of all. Then will the grocers, and finally our ever necessary and useful friend, the middleman hunt us up and do our bidding, and that with right good will. Bear this in mind, you do not merely sell honey to the grocer in pint jars or jelly glasses or five or ten-pound pails; you sell this honey to the great mass of someones scattered among the people. For this reason always put your name on the label and then, though your customers all move to the North Pole, some grocer will beg the privilege of selling to them for you the honey which you will produce.

Among the best methods of obtaining customers are the following:

1st. For the rural districts and small villages. Start out some afternoon about 3 o'clock with a few dozen ten-pound pails filled as full as you can get them, so there will be a few "tastes" in each pail more than

the net weight. Be sure **not** to take along anything smaller than five-pound pails, and preferably only the larger size. Now, the matter of price must be settled in your mind before you approach your first customer. This is affected somewhat by the competition you have, the demand for the honey and the amount available. We shall suppose that at this time when you are starting out to sell your honey that you could get 15 cents per pound for it in 60-pound cans is about 14 cents per pound, road station. Then let us figure. Fifteen cents per pound in 60-pound cans, cased, at the present price of cans is about 14 cents per pound, net. So the ten pounds of honey without the pail is worth \$1.40, and the pail is worth at present 15 cents, which makes the cost to us of the pail and honey \$1.55, and to this we must add 10 per cent for ourselves, 15 per cent for the jobber and 20 per cent for the grocer, which brings the price of the honey, freight included, up to around \$2.40 to the consumer. But, you say, "why charge the grocer's and jobber's profit when grocer and jobber never handled the honey?" Yes, but my dear friend, **you can never eliminate the jobber and grocer**, for if you do sell direct to the consumer, which you cannot do if you are in any way a large producer, you are then both jobber and grocer yourself, and will in time find that **you cannot do their work without their pay**. So, for pity's sake, right at the start, don't fiddle your crop away and fool yourself, but sell at a scientific price; and, if you can't do that, either buy up your unscientific competitors or get into some better territory, or else some business where there are more scientific people. So my advice to you is, "sell your honey in the scientific way at the scientific price." You'll be thought more of in the end, and you'll get to Heaven just as quickly as though you half way give your stuff away. Better go give it away scott free with no strings to it, if you feel inclined, but don't half way give it away. Don't half way do anything.

So let's go up to the first house we come to (don't skip any) with a smiling, good-natured, patient face, a 10-pound pail of honey neatly labeled and a price scientifically premeditated. We'll shut the gate behind us, step up to the door, knock gently but briskly and say to the one who comes, "Does anyone here eat honey?" at the same time holding up the pail.

"No, we don't care for any."

"All right, thank you; sorry to have bothered." Don't argue; it doesn't make friends and it doesn't pay.

But if he is interested at all and

makes no move away from you, then quickly pry off the lid and show him how thick it is. Um! Just extracted and still warm. Fresh honey just from the clean combs; all honey, nothing but honey, with only the indigestible wax removed. Explain to him (or her) that honey is only 30 cents per pound and wax is 40 cents, and that is one reason why extracted honey is cheaper than comb honey. And what good is the wax in comb honey? It is indigestible and perhaps irritating to the intestines. Don't we get enough coarse stuff now with our war bread and all? Be sure to give him a taste; a good big taste, on a clean spoon. He will furnish the spoon all right, or perchance one of the children might be glad to taste it and he will get the spoon.

In general women don't like honey and won't use it. They buy it only for children or husband. So, remembering this, if wife comes to the door and husband comes in sight, get his attention or the children's first of all, for they always like honey and, if they once taste it, and mamma has the money, your pail is just about sold. It's the little things that count, and especially children where honey is on hand. When the honey is sold the remark can often be made to the good wife that if she will use one tablespoonful of honey to two loaves of bread instead of sugar in setting yeast the bread will keep moist longer and the yeast will rise more surely. One tablespoonful of honey is a small amount, to be sure, but its use requires honey in the house, which implies demand, and that is what we are desirous of creating.

It is not necessary or advisable to be a knocker; but, if such substances as Karo or maple syrup are mentioned it may be explained just what "Karo" is and why it is so cheap. It's made of corn, that's true, and corn is as pure as nature made it; but sulphuric acid is not pure and wholesome, and perhaps limestone is not either. And Karo is made of these things, too. Why, even the bees, as fond of sweets as they are, in all my experience would never even go near "Karo." Pure maple sugar is wholesome when made in a cleanly way. When actually pure it is seldom cheaper than honey, and also seldom competes with honey because it comes at a different season.

2nd. For the city it seldom pays here to canvass house to house. The game has almost always been over-worked by magazine artists, sewing machine men and the like; and Mrs. Housewife is sick and tired of running to the door. Also in the city people buy in smaller quantities. In the country, when a smaller quantity is asked for, the customer should be directed to the nearest reliable grocer. Also, if only one canvass is to be made each year, people who buy honey should be told that their grocer will handle the honey for them if they need more later. But in the city soliciting doesn't pay. Yet placing free samples on the front door knobs can often advantageously be done. If the children get them, so much the better. But all free samples distributed at random should

have a seal of paper pasted over the cap so that the bottle cannot be opened without breaking the seal. In fact, now that the kaiser's agents are said to be distributing ground glass so freely in our canned foods, this idea is not amiss to all our honey packages.

Free samples can also be given away right at the grocer's in connection with a good window display. They should contain 3 or 4 ounces, net, in a labeled glass jar. But your grocer, unless watched, is apt to give them away in bunches, sell some, and appropriate the others. The grocer should be made to appreciate their value to him and the necessity for using each one efficiently. Perhaps he will advertise in the newspaper one free sample of honey with each dollar purchase at his store on a certain day. That is one very good plan. In connection with the window display in the city, the one-frame glass hive with some pretty golden bees is very useful to attract attention. A few of these hives will be a good investment. If for no other desirable quality, the golden bees are invaluable here, for on a comb they show up wonderfully.

As a good label is necessary to scientific selling, the discussion is in order. First of all, most people do not know the picture of a honeybee from a humbug, so why disfigure our labels? Also why put pictures of roses on our labels? Do roses secrete nectar? And straw skeps! For the love of common sense, forbear! Be original! If you cannot do better, just print "Honey" in great big red or blue letters in nice clear type, so people can see it and will believe it and buy it and go their way rejoicing. All labels should show the net weight of contents and the class of honey, and if possible the principal flowers from which contents were gathered; also, directions for melting in case of granulation, and the producer's name and address.

In selling to the grocer the grocer's profit of at least 20 per cent should be deducted from your retail price. It costs most grocers this to pay rent and expenses and make a moderate profit.

I advise all honey producers to sell for cash only, R. O. G. If you can't do this, call in the jobber and give him his 10 or 15 per cent for handling the credit risk.

But remember, you can't be producer, jobber, grocer, consumer and all. You've got to stop somewhere if you are to make money. Render unto Caesar the things which are Caesar's and unto the jobber and the grocer the profits which are theirs, and unto the consumer the best grade of pure honey you can produce.

Yakima, Washington.

My Neighbor's Garden

By C. D. Stuart.

IT was summer. I had just gone to the apiary to swarm, artificially, the colony containing my new ten-dollar breeding queen, when bridal-like draperies above flying feet

all unhampered by insignia of the sex suddenly appeared among my beehives.

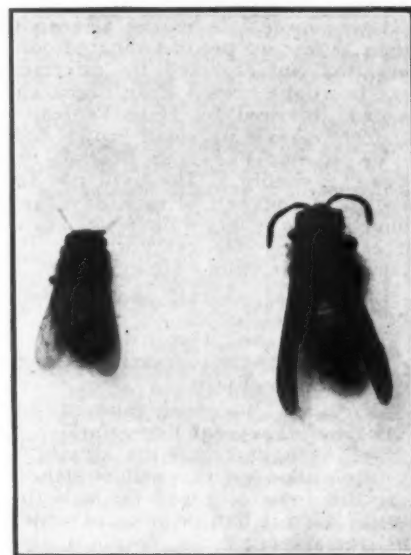
The apparition proved to be our new neighbor, Frau Clara, in the perspiring flesh. We had met at her artist husband's concert only two months before. The audience was on its feet clapping for a final encore when she spied me.

"Ah!" she cried, "I know you. You are the gen-tle-mann with the beans." And Herr Professor, still seated in front of the Club's baby grand, smiled dutifully in my direction.

The crowd around the platform parted, and those ladies who had not already discovered that I was the only male present, were now eager to observe one possessing money. Instinctively my hands sought refuge in my beanless pockets.

"Madame," I answered, "I haven't a single bean."

"Oh, yes; little yellow beans." Her tone was most insistent.



Nectarivorous and carnivorous "beans"

Could Frau Clara have confused me with the vegetable man, and was she taking advantage of the occasion publicly to rebuke me on the size of my produce? I wondered. Or, wait! she had specified **yellow** beans. In her tongue, might not "bean" signify a gold coin? The situation was perplexing; but I stood my ground.

"I have no beans, neither little beans nor yellow beans. I am an apiarist," I concluded, with conscious pride.

"Do I make meestake?" Frau Clara appealed to the women. "The gen-tle-mann he look always so," holding up her arms as though inspecting at close range a small platter.

"She means bees," volunteered a recently initiated neighbor.

"Yes," beamed Frau Clara, "beans."

And, having reached the end of our conversational rope, the Magic Girl came to the rescue by inviting them to come to see our "beans," and taste our honey. Whereupon Herr Professor beamed right out loud:

"You haf piano, yes? Then I come und blay for you."

So my good little bees had not confined their social activities to the visiting of flowers, and as we passed out we were followed by envious glances. For Herr Professor had arrived. The ladies of the Club no longer wondered if he were in America to avoid war duty, or had been banished for political reasons. Also they ignored the report that his marriage to Frau Clara had been sanctioned by neither Church nor State. He had made their piano speak to them in the one universal language. That was enough.

"On the day before Friday," bee fixtures, catalogues, magazines and a stack of beeswax were concealed in the basement; the piano was dusted, tuned and garnished with flowers; a square of honey placed on the best plate, the choicest amber mead set out; and, last of all, our bee uniforms regretfully exchanged for citizen's clothing. No sacrifice of personal comfort was too great in honor of Europe's favorite pianist.

It was quite late in the afternoon when at last we heard animated conversation, interspersed by intermittent howlings. Soon Frau Clara appeared, followed by Herr Professor tenderly carrying a small brown dog.

"Ve do not like your beans," she began, excitedly. "They will not let my leetle dog eat. Every day they come and take his dinner—an' meat so exbensive! He get nothing. He starve. He is sting. He cry."

"Impossible!" I told her. "Bees don't eat meat."

"Yellow beans," she insisted.

"Perhaps it's yellow-jackets," suggested the Magic Girl.

"Of course," I agreed, relieved. I'll show you. They eat bees, too!"

So I brought from the apiary a fly-trap filled with yellow-jackets that had been captured through the lure of a meat bait, a piece of which still remained in the trap. I also



Frau Clara in hastily improvised bee costume
(Photograph by W. B. Dickinson)

pointed out a honey-bee which the enemy had dragged in. Then I went out again and tapped gently on the side of a hive as I had seen the birds do at breakfast time. A bee peered inquisitively through the opening. At the second tap it came out and crawled up the front of the hive. In a second I had the insect by the wings and pinned alongside a yellow-jacket, where even Frau Clara could distinguish, though reluctantly, the carnivorous from the nectarivorous "bean."

Herr Professor radiated smiles, and, much to the disappointment of

the Magic Girl, he discarded the promised classics and improvised on the piano the wierd things our beans had done to their dog, while the latter continued to howl its own version of the affair. But only with the serving of the amber mead was Frau Clara fully convinced. She grew confidential. It seemed she had always lived in a "beeg city, Vienna," had never owned pets, except "von leetle cheeken," and she would so love to have some beans, for "such good drink" she "nevair" tasted, so much, "what you call? Keek" (kick.)

It was the next morning that Frau Clara appeared, wraith-like, in my apiary to tell me that their garden was full of beans, and Would I give her a box like mine, "so they go in?" I handed over the hive just prepared for my own use in the artificial swarming project, and, like a true beeman, abandoned work to be in at the hiving.



Counting the few remaining "Beans"
(Photo by John R. Douglass)

When I arrived the bees had been settled in a cluster on the limb of a young fruit tree, presumably by the rhythmic tom tom of the valiant Professor, who still knelt just beneath, the baby grand having been temporarily replaced with dishpan and hammer, "so like old countree," and his concert attire, apparently for the garb of a hobo.

The bees were indeed yellow and of a rare, though singularly familiar shade. I examined them more closely, then hastened back to my apiary and opened the hive containing the new queen. My suspicions were correct. She was gone, together with most of her subjects, whether swarmed, absconded, abdicated, or merely enticed by the witchery of Herr Professor's music, was of small matter. It was the thought of my finest colony at that moment being made comfortable in my neighbor's garden, and in the very hive I myself had provided, that rankled, and,



Old "Countree" method of catching bees

involuntarily, strong, appropriately-worded sentiments escaped me.

"Are you stung?" called out the Magic Girl, sweetly.

"Am I stung!" I began, then remembered to restrain myself, as I continued grimly to count my few remaining "beans."

Los Gatos, Calif.

The Maintenance of Colonies From the Close of the Honey Flow One Year Until Its Beginning the Next.

By **Geo. S. Demuth**, Apicultural Assistant, Bureau of Entomology

(Continued from August issue)

This paper was prepared as an address, and not as an article for publication. This will explain certain passages in which the meaning may not be quite clear if the reader attempts to interpret it as a paper for publication.

Food

Fall Food—The most important of these requirements is food. A colony well supplied with stores at all times will stand a tremendous amount of abuse in the other two requirements. If an abundance of stores is present during late summer and early fall, brood-rearing does not cease, even during a dearth of nectar, but if stores are meager in quantity at this time, brood-rearing may be entirely suspended. It should be noted that, when there is no fall honey-flow, the winter colony must be reared in opposition to the instinct of the bees, which at this season is to rear but little brood during a dearth of nectar. If ample stores are not in the hives in August, they should be supplied without delay, if the beekeeper expects to have a colony in condition for winter.

Winter Food—During the winter not only quantity but quality of stores is important, especially if the bees do not have frequent flights. The practice of beekeepers shows a decided tendency to supply in the fall not only enough stores for winter, but also enough to carry the bees through the heavy brood-rearing period the next spring. Any deficiency in winter stores should be supplied not later than some time during October, in this locality.

Spring Food—During the third period, the stores are being so rapidly converted into bees that there is danger that many colonies will run short and curtail brood-rearing just at the time when the beekeeper can least afford it. I have seen many failures here and could cite tremendous losses, even among experienced beekeepers, resulting from a shortage of stores during the month of May. Unfavorable weather conditions often prevail during this period and the beekeeper, thinking each day that the next will bring better weather and permit the bees to replenish their depleted stores from the fields, is easily led to wait just a few days too long. To purchase large quantities of sugar

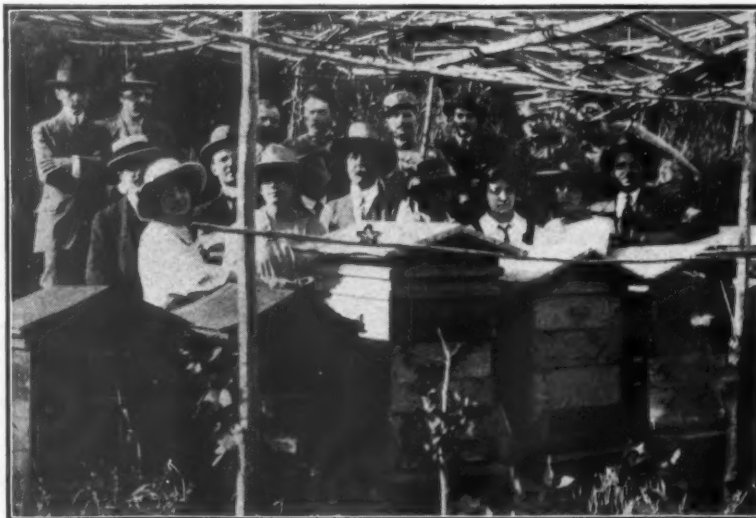
to tide over the period just before the honey-flow, when conditions may change even before he has had time to feed it, tests the metal of the beekeeper. Too often he goes through such a period with a feeling of security and does not appreciate the situation until after the mischief has been done. To cite one illustration of what I mean here, I saw at one time during the latter part of May a series of six apiaries in which about 10 per cent of the colonies were actually starving and the entire lot of about 600 colonies was practically ruined for the season, because the beekeeper thought they could pull through without help. Here a 600-colony man waited a few days too long before he began to feed. The honey-flow that followed was a 100-pound per colony flow, but his 600 colonies furnished an average of only about 10 pounds per colony. This is but one of many such instances that have come under my observation, in addition to some exceedingly unpleasant recollections of similar personal experience, which has helped to drive home this important lesson. It is not a question of a supply of food in the hive merely sufficient to keep the colony alive during a period when nectar cannot be obtained from the fields, since long before there is actual starvation, brood-rearing is greatly reduced, or even suspended, and some of the immature young are carried out of the hive.

Protection

Fall Protection—The protection afforded by the ordinary single-walled hive is usually sufficient during summer and early fall, since during that time the protection needed is largely protection against rain and cool nights or robbers and other enemies. In some localities shade is desirable during the hot days of summer to protect the colonies from extreme heat.

Winter Protection—It has been shown that when the temperature of a colony of undisturbed, broodless bees is above 50 degrees F., the bees are quiet and their temperature

drifts with the external temperature. A temperature of 57 degrees F. and above is maintained within the cluster of bees throughout the winter. This temperature is maintained during cold weather by an insulating crust of bees on the outer surface of the cluster and heat generation by muscular activity within the cluster. As the temperature of the air surrounding the cluster goes downward below 57 degrees F., the activity of the bees within the cluster must be increased in order to maintain the required temperature of 57 degrees F. and above within the cluster. This greater activity makes it necessary that the bees doing the work consume more stores to supply the source of the greater energy expended. More rapid consumption of stores results in a more rapid accumulation of feces, which the bees attempt to retain until a flight permits voiding them outside the hive. The presence of feces in large quantities acts as an irritant, causing activity in addition to that required to maintain the necessary cluster temperature, thus greatly increasing the energy expended and stores consumed. This results in a constantly increasing accumulation of feces until the bees are relieved by a flight in the open air. Poorer grades of honey and especially honeydew honey, when used in winter, result in a more rapid accumulation of feces for the amount of energy expended than do better grades of honey or sugar syrup. During the winter, therefore, except when the external temperature is between 57 degrees F. and 69 degrees F., bee energy is being expended in response to one or both of two irritants—cold and accumulated feces. Since to survive the winter the bees must live more slowly than they do during the summer, the problem of the beekeeper during this period is the conservation of the energy of the bees, and he must seek the solution in two directions—that of better food, if possible, but chiefly that of protection against low temperatures, that is, lower than 57 degrees F.



Part of the apiary of the Agricultural School at Rome, Italy; Prof. G. Montagano in charge

This added protection may be supplied in the form of winter packing-cases or double-walled hives, and a windbreak (outdoor wintering), or a winter repository (cellar wintering). In the light of the temperature requirement of the bees, the winter protection usually given is woefully inadequate.

Spring Protection—When brood-rearing begins, that portion of the brood-nest occupied by brood is kept at brood-rearing temperature and later, when there is brood in most of the combs, the temperature of the entire brood-chamber is usually about 90 degrees F. Under these conditions thin-walled hives permit a rapid loss of heat when the outer temperature is low. For this reason the winter protection is usually left on the hives until late in the spring. Protection of the entrance against robbers is also important during this period.

Room for Expansion of Colony Activity

Fall Room—The storage of food as well as brood-rearing comes in waves and usually at about the same time. If the hive is not large enough to contain the maximum of both at the same time, it may be necessary that the beekeeper provide additional room during a minor honey-flow, either during the fall or spring. When the hive is too small for both stores sufficient for fall and winter and for adequate brood-rearing during late summer and early autumn, it results either in colonies short of stores for winter or colonies for winter greatly reduced in strength, or both.

Winter Room—When brood-rearing space and storage space do not interfere, there is probably no advantage to be gained by an excess of room, and during the winter broodless period it may be advantageous even to reduce the size of the brood-chamber to fit the colony.

Spring Room—During the heavy brood-rearing period of spring, the strongest colonies may need more room than that afforded by a single hive-body, and it is at this time that additional room is of great importance, because of the bearing it has upon both the production of bees and swarming. The problem is usually solved either by adding an extra hive-body with empty combs or by expanding the brood-chamber of the stronger colonies into unoccupied space of colonies less strong by what is known as equalizing the brood. This is done by exchanging combs of sealed brood from the stronger for empty combs from the weaker colonies.

Providing the Three Requirements

It would seem that one of the greatest needs of the beekeeping industry is some stimulation to a better system of supplying any deficiency in these three fundamental requirements early enough to prevent loss. There are two extremes of method in supplying these deficiencies. One is to watch the colonies daily in order promptly to detect their needs and then to supply each

colony as the need develops. The other is to supply the three requirements, if not already present, for long periods in advance.

The former is the method usually used by the beginner. It involves a tremendous amount of labor, constant attendance in the apiary, and is largely responsible for our conception of the complexity of beekeeping. The latter method greatly simplifies the work, substitutes system for too frequent a lack of system and makes possible the operation of outapiaries. It may, however, sometimes involve the giving of something that could have been omitted without loss. A fall honey-flow may take care of the food requirements of the colonies at that time and a large hive may furnish enough room for both incoming nectar and brood-rearing. A mild winter may make it seem to have been unnecessary to pack the hives so well or to have furnished shelter from the wind, and, finally, the maple, dandelion and fruit bloom may supply an abundance of food for brood-rearing during the spring. But we cannot be sure of any of these things and cannot afford to take any chances of the requirements being supplied in this way.

When food is given in advance, it is stored, not wasted, and remains in storage until needed. We can also give protection for winter and room for expansion the next spring just a little ahead of the time they are needed. It is even possible as an emergency expedient, in localities having a single major honey-flow, to prepare every colony at the close of any given honey-flow for the entire period of preparation for the honey-flow the next year, or a period of ten or eleven months. Most of us would be surprised on our return ten months later to find how well the bees have been able to take care of themselves without us, if they have an abundance of stores for every possible need, an abundance of protection against the most severe winter the locality may afford, and an abundance of room for expansion before the honey-flow the next spring.

There is a growing tendency among

beekeepers to use a shallow extracting super or hive-body filled with honey, above the regular brood-chamber throughout the year, except possibly during the honey-flow. Its presence throughout the interval between honey-flows, together with adequate winter protection, leaves little that the beekeeper can do toward having the colonies strong in time for the honey-flow.

The Winter Problems of the South

By J. J. Wilder

UP on the mountains in the section of our country with high altitude, a little winter care might be of some value, as it is much colder and there is more snow and ice than in the lower country, where the average temperature is from 50 to 70 degrees during the winter months. But even there my observation leads me to believe that special winter preparation is not necessary.

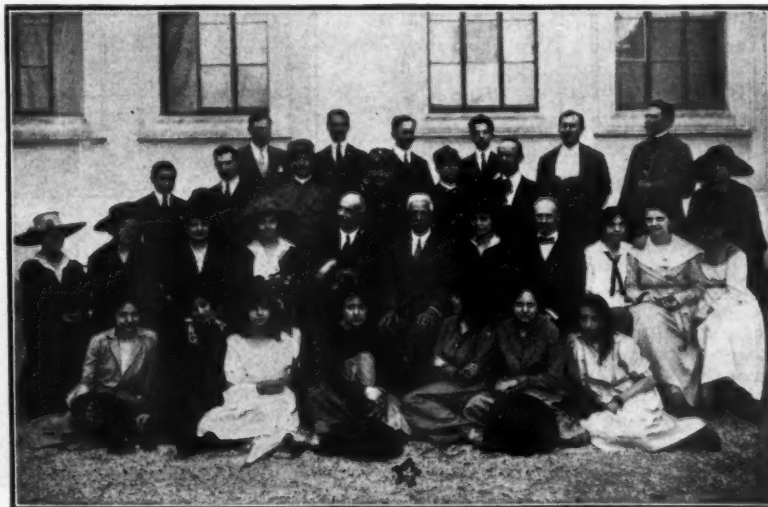
I have never seen any colonies of bees frozen, except very small, neglected swarms. Nor have I seen many dead bees fall from the clusters during winter. Many times I have wintered a pint of bees in its hive on summer stands. So, actual winter losses are exceedingly small.

A few times I have spread brood a little too early, and this resulted in just a small loss of brood.

I kept a house apiary for a number of years where the bees had the best of winter protection, with results to the reverse. I don't know why. They consumed more stores, dwindled more and were far behind the others in the same yard out in the open.

The same thing that will keep bees in thriving condition in spring, summer and fall will keep them through the few winter months.

Many times more bees or colonies of bees die in the fall and spring than during the winter months. Every beekeeper knows this is true. So there is something far more vital than the average beekeeper would



Group in attendance at the Beekeeping Course under the supervision of Prof. Montano

call "wintering" or "special preparation of packing and protection of hives, etc."

Let us look into all the winter problems we need to worry ourselves about.

Of course, bees should be kept in good hives all the time, and should have plenty stores when it is a long time until the next honey flow, winter or summer.

They should be requeened when they need it and not when it is too late to save the colony or have its good service during a honey flow. These are "all the time" problems.

A majority of beekeepers leave the supers, hive bodies and all storing apartments on the bees over the winter months. This is a great mistake, wherever it is practiced, and should be abandoned.

It is too much space above the bees. Better by far would it be to have all the brood, bees and plenty of honey in one single body and a good cover on it. Thus they have snug and contracted quarters, such as they need for their good.

When 8-frame hives are used it would not be amiss to leave one set of shallow extracting combs on, and they should have more or less honey in them. Bees have to maintain animal heat to exist, and a great space above them would be harmful.

The first zero weather will kill all scattering moths, both large and small. Then they are all right until time to put them back on next spring. If combs are removed and stacked up in the yard and covered just before the first freeze in the fall, they will need no special treatment. If much earlier they should be stacked up straight in high stacks and covered up well with straight water-proof covers, and all cracks daubed with clay, so as to be as near airtight as possible. Then give each stack a good, strong sulphur smoking, from the bottom, for not less than 10 minutes; then close up well. Or you can set in at the top of each stack a very small, flat vessel of carbon disulphide.

Cordele, Ga.

Winter Protection of Bees

By T. K. Massie

REGARDING the subject of winter protection, which of late has been receiving considerable attention, I wish to offer a few thoughts, as they, from long experience and observation appear to me.

The Government plan of outside dual winter cases, while all right for bees in thin-wall hives after the bees are placed in them, is so very costly that it will never be adopted by even one per cent of our farmer-beekeepers. The first cost of material and labor in their construction, the time and labor required to pack in the fall and unpack in the spring and the storage room and labor of storing them during the summer are so very great that few beekeepers will ever try the plan. Farmers do not have the time for all this kind of work.

The plan of using two hives packed in the same case where the entrances are close together and face in the same direction is not practical, because the stronger colony draws the bees from the weaker one, just the opposite of what we would like to have take place.

The Demuth-Pritchard plan of using two or three hive-bodies or two hive-bodies and a super for an outside case and an inside case of $\frac{3}{8}$ -inch lumber made large enough to hold six frames standing on end, which, of late, has been referred to and commented upon in "Gleanings" and illustrated in the American Bee Journal on page 13 for January, is open to several objections. With this plan the first cost of material and labor in making the cases, the time and labor spent in "fussing" with the packing and unpacking, the storage room, time and labor spent in storing the inner cases in summer and the storage room, time and labor required to store the surplus frames—the two or three frames removed from the brood-chambers—is too great. As a rule farmers do not have the time to spend in doing so much extra work, neither does the average beekeeper.

Four of the best colonies of bees I ever saw are owned by Mr. Ayres Hill, a farmer who lives four miles northeast of Princeton, our county seat. Mr. Hill knows nothing about bees and keeps them absolutely on the "let alone" plan. I inspected his bees on the 18th of July. I found them in old box hives made of $1\frac{1}{2}$ -inch lumber, 18 inches wide and 27 inches tall. The bees had coated the entire inside surface of the hives with a considerable thickness of wax and propolis. The condition of the bees proved that they had wintered perfectly the winter before. They were "boiling over" with bees. There seemed to be more than the equivalent of two large swarms in each of those hives. Our honey season has been rather a poor one, but each one of those hives had 100 pounds of surplus honey on it.

Now, a few lessons here. Where did the bees in those hives form their winter cluster last fall for the

past cold winter? Evidently on the empty combs along the lower lines of their honey and over the cells from which the last brood emerged. The guess is sure. As their honey is consumed they can move upward for it and keep up with their diminishing stores. This is the normal way. Now, suppose man, with his superior knowledge (?), had gone to "messing" with those hives on his great idea of vertical contraction and removed some of those combs, thus separating the bees from their combs and wax-coated walls, all of which are non-conductors of heat and cold, and inserted wooden "dummies" which are conductors of heat and cold, would he not have done damage to the bees and defeated the very object he was trying to accomplish? Again, suppose that those bees had been put on combs filled solidly full of honey and pollen, no empty cells, where would we now find the bees clustered in very cold weather? Just as far away from the entrance as they could get, which would be at the tops of the combs. Then, if the honey over which they are clustered is consumed during the continuance of the cold spell, what would happen? They would all starve because they could not reach the honey below them. With the Demuth plan, the combs standing on end, the empty cells which were at the bottoms of the frames extending all the way from the bottom to the top along one edge and the honey along the other edge, or side, they are placed in a vertically contracted and abnormal position, and I would expect them to again form their winter cluster at the tops of the frames and starve. If I were to use this plan I would put the bees in the inside case early in the fall and feed liberally to cause them to fill the top part of the frames with honey and rear brood in the combs at the bottom so that they would form their winter cluster in a normal position at the bottom ends of the frames. Again, six frames, containing only about 825 square inches of comb, is not enough to supply room for brood-rearing in the spring. Very few beekeepers use hives large enough.



J. G. Norton, of Macomb, winters on summer stands.

When a good queen is laying 3,000 eggs every 24 hours it will require 1,350 square inches of comb to supply room for the queen, to say nothing of the comb-space to hold sufficient honey and pollen to supply the need of the colony.

Hatcher, W. Va.

A Summer and Winter Hive

By D. C. Noble

THE first picture shows the hive as it appears in use. The second shows it with cover removed in summer. It holds fourteen Hoffman frames. For winter two or three frames are removed from each side and division boards put in. The empty space is then filled with dry leaves or chaff for winter packing. At the rear of the hive there is also a 2¼-inch space to be packed in a similar manner. When packing material is removed, the hive may be pushed back if desired, to permit the space in the rear to serve as a ventilating chamber conducting fresh air to the top of hive.

Each super holds forty 4¾ sections. With the side frames removed, the hive has the same capacity as the standard Langstroth hive, so that parts are interchangeable.

Columbia City, Ind.

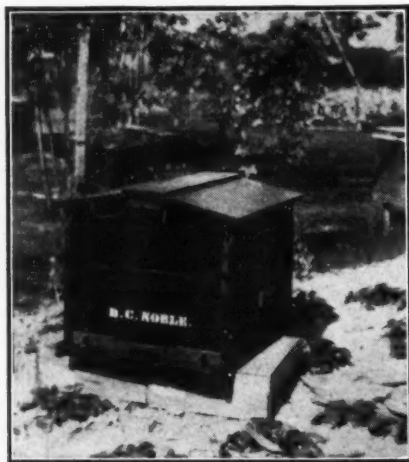
A Letter From Scotland

THE following letter from our learned Scottish friend of Aberdeen may prove interesting to our readers. We call especial attention to the last paragraph, which suggests a new thought.—Editor.

By John Anderson, M. A. B. Sc.

Many thanks for your delightful letter of April 29. It is so good of you to send me such a long letter when you must be so very busy with matters of much more importance. In your last two letters to me there were references to the war, references and sentiments with which I cordially agree, and it is interesting that both were opened by our censor. I hope he is pleased.

The May American Bee Journal is



Noble's all-year hive

at hand and I have read Fabre on parthenogenesis. I agree that the evidence is not sufficient, and that the conclusions are unwarranted. Possibly he makes too much of the eggs of drone breeders not always hatching. The bees get disgusted with those queens and weakened and sometimes neglect the grubs as well as the eggs, so it is not surprising that some of the eggs remain unhatched. I had the opportunity of examining two queens which laid abundantly and regularly, but none of whose eggs hatched. In both cases it was quite clear by microscopic examination that the queens had been duly mated. Cook has also verified this.

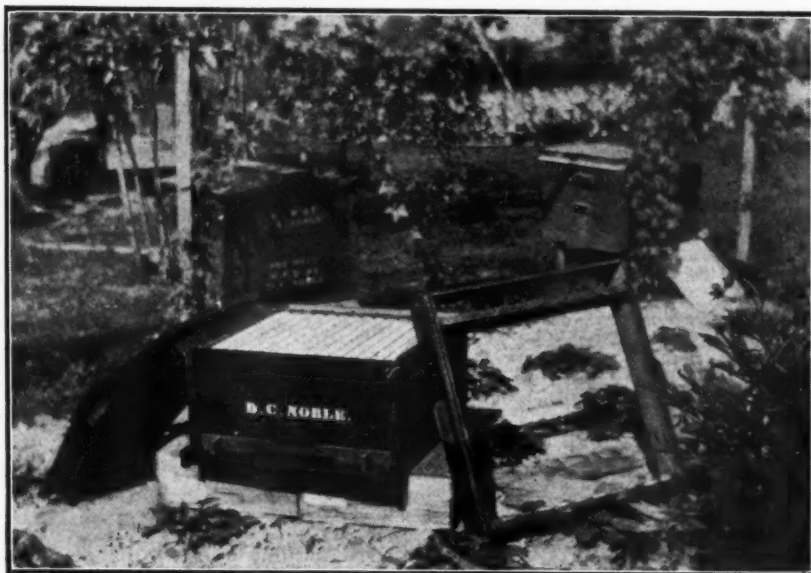
Fabre is always delightful, but one cannot always agree with him. He thinks, for example, that ants find their way home on common sense principles, by means of landmarks

can keep a stock all summer rearing batches of queens if you simply supply eggs at intervals. It doesn't matter how many cells they have already, or what stages these may be at. There may be even loose queens piping on the comb. I had a stock with five sealed queen-cells, to which I gave a comb with eggs; they have started fresh cells on those eggs.

We have coddled and fed our bees far too much, and we have been too successful in wintering. It does not seem to occur to you that the high winter death rate among bees in America is probably an important element in the success of Americans in honey production. There may be a loss of perhaps as high as 75 per cent, but the 25 per cent left have been sifted and are likely to be hustlers.

Good luck to you, and more power to your elbow.

Banff, Scotland.



Noble's Hive, showing the parts

Hive Entrance

By A. F. Bonney

FROM time to time there appear suggestions for protecting the entrance of hives during the winter, but up to the present time nothing which meets general approval, and those who winter out of doors seem to trust to luck.

It is not only in outside wintering that the entrance of a hive needs protecting, for from the time the bees are removed from the cellar until settled warm weather comes they are in a critical position. They have to be protected with a wrapping of tarred paper, and the spring winds, some of which are very cold, rob the hives of heat, as much of it is sucked out of the hive through an unprotected entrance.

This is, of course, threshing over old straw, but in doing it, mentally I think we have discovered one grain of wheat, in an entrance protector, which is convenient, cheap, easily applied, cannot get out of place, makes it practically impossible that the en-

but that bees, wasps and cats have a mysterious homing instinct, or sense of direction. If he had been able to watch the bees as closely as he could the ants, I think he would have concluded that these, too, found their way home just as we do.

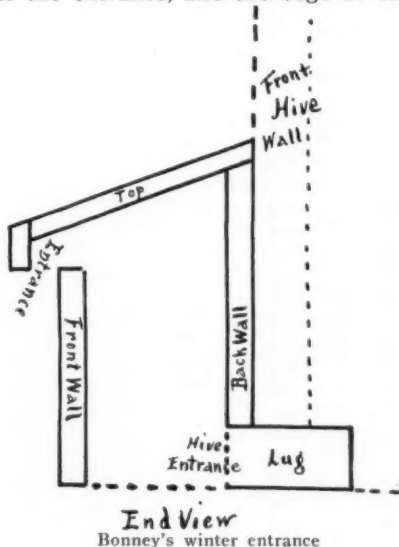
I have read as much of your life as I could get hold of and envy you the great privilege of beginning where your father left off. I agree that a lifetime with the bees is not enough to exhaust the interest. Fortunately, the bee enthusiast need never, like Alexander the Great, weep for more worlds to conquer.

You may be right in suggesting that the supposed worker-egg-laying worker may be a small queen. My Punics have made bundles of queen-cells, as did Cyprians I had years ago, and some of the cells appeared quite small. I have divided into nuclei and laying-workers have already started in one of these, though the queens are not yet due to emerge. I shall have more to say later.

I have been trying out another of Hewitt's theories. He says that you

trance clog with dead bees, snow or sleet, which almost every year cause the loss of many colonies to those who winter out of doors, and the number of those who do is increasing. The beginner, with a few colonies of bees is practically forced to, as he cannot afford a cellar, and would not know how to use it if he had one.

My idea of a perfect entrance protector consists essentially of a box, made of thin material, $1\frac{1}{4}$ inches long, 2 inches from back to front, and 2 or more inches deep. The top slants forward at an angle of about 20 degrees and projects past the front half-an-inch or more. Just under it is the entrance, and the edge of the



top is painted white to locate the entrance; the rest of the box is painted black. There is a back to the box with a three-quarter-inch opening to correspond to the hive entrance, and two lugs, each 2 inches long, one at each end, to slip into the entrance to hold it into place. A strip of wood extends down from the front edge of the cover to protect the entrance from wind and snow.

The advantages I claim for this idea are as follows: It conserves heat, as no wind can blow directly into the hive; dead bees cannot obstruct the entrance, as the $\frac{3}{4}$ inch opening is wide open all winter; the box being painted black and the strip over the entrance white, the bees easily find their way in; the first rays of the sun will be absorbed to thaw ice and snow long before the bees are warm enough to fly out; the boxes can be made cheaply, and they will, if kept painted, last for years.

Buck Grove, Iowa.

Beekeeping Around San Francisco Bay

By E. D. Crowl

WE started out this spring with three nuclei in our back yard, no one of which was large enough to cover three frames. Brood-rearing in two of them had not stopped during the winter, which was un-

usually mild, and in the third, which was the smallest, had stopped about November 1 and begun again December 27. They grew strong rather slowly, probably due to the weak condition of the colonies. The nights are very cold early in the year (they are never warm at any time here) and this year the fruit bloom was late, apricots not coming into bloom until the middle of March, which no doubt hindered the building up somewhat.

On March 20 the strongest colony, in an 8-frame hive, had brood in all of the frames, and the bees were putting honey into the brood-cells until it interfered with the queen's laying, and there were not as yet bees enough to care for the brood and work in the super also. We had the same trouble with all three hives, filling everything with honey until it interfered with the brood. March 30, peach, early cherries and plums were in bloom, and work began nicely in the supers.

Fruit bloom lasts a long time here, almonds beginning usually in February and apples ending the season. This year the apple bloom was over about the middle of April, somewhat later than ordinary. This certainly gives the bees a good chance to build up. About the first week in June the flow diminishes, though there is some all summer. Then in August the fall flow begins and lasts till it gets too wet and cold for the bees to fly. The eucalyptus trees commence blooming in the fall and furnish a good deal of honey. The bloom from the different varieties lasts all winter and until late in the spring, but owing to the generally cold and rainy weather the bees cannot make the best use of it.

White clover amounts to nothing here, though there is a good deal of it in the lawns. It seems to have no nectar, as the bees are seldom seen on it. There is a good deal of dandelion, which blooms all summer, but the bees pay little attention to it. The bloom of the different varieties of acacia cover many weeks, usually beginning in early January, and the bees seem fond of it; but coming so early, the weather is usually too inclement for them to get the full benefit of the bloom. The excretion which they gather, in some varieties, at least, is found, not in the blossoms, but on the edges of the leaves. I have not had an opportunity to observe whether this is so in all varieties.

During July and August a bright red honey, in very small quantities, is gathered from something, I have not been able to ascertain what. It is a very well flavored honey, but only an occasional cell is filled with it. The honey gathered here is amber in color and of no particular flavor, being obtained from all sorts of sources—just honey. The usual sources of California honey, sage, orange, bean and alfalfa, are not, of course, to be had in a city.

The weather around the bay cities is, taken as a whole, too cold and foggy, and there are too many days

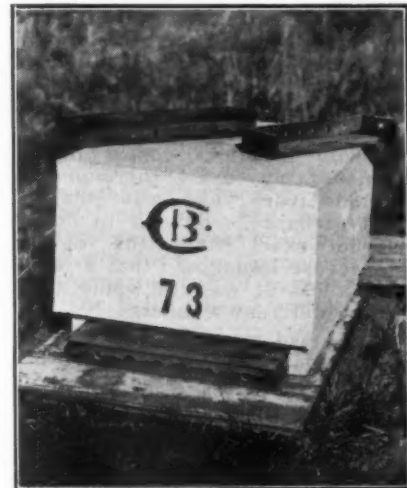
with high winds for good bee-keeping. We have, however, had all the honey we could use and a good deal to sell, and have five additional hives, formed on the nucleus plan, with queens raised above an excluder over the strongest hive we had. We could, of course, have had more honey if we had not used any of the bees for increase. These new hives will probably be strong enough to gather some surplus during the fall flow, as one of them already has five frames of brood in it and another three, although they were formed late. Our warm weather generally comes during August and September—in fact, it is about all the summer we have, so I hope for considerable honey during that time.

Berkeley, Calif.

A Winter Entrance

By C. W. Brimhall

THE photo gives a good idea of my special winter entrance and how it is used. Beekeepers, who winter outdoors in the north, are familiar with the clogged entrances that often result from the melted snow freezing in the entrance



Winter entrance of C. W. Brimhall

and filling it with ice. This special cover protects the hive from direct drafts of cold wind, as well as keeping the snow from melting and clogging the entrance with ice. The bees can readily leave the hive when conditions are favorable. A brick is placed on top of this guard, to hold it firmly in place.

Schaller, Iowa.

The Temperature of the Bee's Body

By Dr. Brunnich

IT is a well-known fact that bees are able to produce warmth, that they may, especially in winter-time, keep the temperature within the cluster at a point which surmounts, by far, the temperature of the outer air. Most of us have read with great interest the experiments

which were made in Dr. Phillips' laboratory.

As Berlepsch already stated, it is now generally known that the temperature in the brood nest in spring and summer is about 37 deg. C (98 deg. F.) This warmth must be produced either by the surrounding bees or by the brood itself. The latter is little probable, because it is clear that eggs and little worms cannot produce warmth enough. It is even a question whether the older brood is but a consumer of warmth (produced by adult bees) or whether it may generate some warmth itself. To solve those and other questions, I made the following experiments:

I wished to measure the inner temperature of bees and brood with an electric thermometer. The principle of this is a simple one. If we form a circle by two different metal threads, for instance of platinum and copper, there will be produced an electric current if the temperature of one soldering is higher than the temperature of the other. An exact and most sensitive galvanometer shows us the relative importance of the current. With the help of a professor of physics, I constructed a fine needle, which was formed by soldering a thread of platinum, 3-32 m m of diameter, with a thread of copper, 5-32 m m. The other soldering of the platinum thread with a thicker copper thread was about 1 cm from the point. The whole needle was fixed in a clamp and near the soldering of the platinum with the thick copper thread we placed an exact thermometer. The only fear I had was that it would perhaps be difficult to determine the exact temperature of the bee, because I supposed that at once a great loss of warmth would arise in three different manners:

1. The bee immediately ceases to produce warmth and therefore begins to cool by irradiating its warmth; however, this loss is significant and slow.

2. The threads of platinum and copper draw off by conduction a certain portion of the warmth of the surrounding animal matter.

3. The greatest loss arises, perhaps, by the formation of the electric current, because the current is formed by absorbing the surrounding warmth.

The success showed that my fear was well founded. To prove it I made a number of experiments where we noted the temperature shown by the galvanometer, first every 10 seconds, and later every 5 seconds. I will give the result of a single experiment, No. 47: A flying bee which was pierced with the thermo needle into the breast. The temperatures shown on the galvanometer were:

After 5 seconds	29.4 deg. C
After 10 seconds	34.5 deg. C
After 15 seconds	36.2 deg. C
After 20 seconds	36.1 deg. C
After 25 seconds	34.8 deg. C
After 30 seconds	33.3 deg. C
After 35 seconds	31.8 deg. C
After 40 seconds	30.2 deg. C
After 45 seconds	28.9 deg. C

After 50 seconds	27.5 deg. C
After 55 seconds	26.4 deg. C
After 60 seconds	25.3 deg. C
After 65 seconds	24.4 deg. C
After 70 seconds	23.4 deg. C
After 75 seconds	22.7 deg. C
After 80 seconds	22.0 deg. C

The other experiments showed the same scale and we established that the maximum was reached always after 15 seconds.

Of course, this maximum does not correspond to the beginning temperature, because in those 15 seconds the temperature of the surrounding medium will sink steadily. It would be the same if you wished to weigh a little portion of ether in an automatic balance; you would not be able to get the true weight, because a great deal of the ether would be evaporated, if the hand had reached its maximum. With the help of mathematical speculations, I could find that the real temperature—between the limits in question—would be about 1½ to 2 degrees C. higher than the first maximum shown by the galvanometer.

I was certain to get the best results by piercing the bee in the breast, because there the inner body is most compact, while in the head, as well as in the abdomen, there are many air sacs. When I did not succeed in piercing the breast of the bee in a correct way, I got less temperatures; for instance, when the point of the needle penetrated the thorax so that it became visible, the temperatures of the abdomen were all 10 to 15 degrees lower than those of the breast; therefore, I did not note those results, with the exception of 2 or 3. The temperatures of the bee breast alone are to be considered as standard.

As to the temperature of the brood, I could only make experiments with capped brood, because, for my needle of 5 mm length, the worms were too little. It is natural that also with the brood I did not always succeed in pricking exactly enough, therefore some of my results may be too low.

The first five series are made with a mating box with three movable frames 12x6 in. with a fertile queen and with brood up to about 17 days. The other experiments were made with a queenless section of my construction, i. e., a single frame of 15x 4½ in., with brood also about up to 17 days, and later on with a few queen-cells.

1. April 15.—Outer temperature 15 deg. C (59 deg. F.) All bees flying ones.

1.	36.6 deg.
2.	32.1 deg.
3.	34.5 deg.
4.	37.5 deg. (99 deg. F.)
5.	35.0 deg.
6.	33.7 deg.

2. April 18.—Outer temperature 13½ deg. C (56 deg. F.)

(a) Fanning bees before the flight hole.	
7.	31.7 deg.
8.	36.6 deg.
9.	38.7 deg. (102 deg. F.)

10.—35.2 deg.

(b) Returning bees.

11.	31.8 deg.
12.	33.5 deg.
13.	36.5 deg.
14.	31.0 deg.
15.	38.8 deg.
16.	33.0 deg.

No. 14 had been caged in a metal box for 10 minutes. No. 16 had been sitting for some minutes idly on a window.

(c) Flying off bees.

17.	34.1 deg.
18.	39.0 deg. (102 deg. F.)
19.	37.7 deg.
20.	38.0 deg.
21.	29.2 deg. (abdomen).
22.	39.2 deg.

3. April 20.—Outer temperature 7 deg. C. (44½ deg. F.) All bees had been caught on the flight hole with a pincer.

23.	23.1 deg. (abdomen. Immediately after this, breast 28.6 deg.)
24.	32.0 deg.
25.	36.3 deg.
26.	36.0 deg.
27.	37.2 deg.
28.	32.8 deg.
29.	36.3 deg.
30.	34.5 deg.
31.	36.0 deg.
32.	36.6 deg.
33.	36.7 deg.
34.	37.4 deg.
35.	38.1 deg.
36.	33.0 deg.
37.	37.7 deg.
38.	37.7 deg.
39.	32.4 deg.
40.	33.5 deg.
41.	38.2 deg.
42.	37.3 deg.
43.	38.9 deg.
44.	37.3 deg.

No. 45 had been spit, but flew off after being caught; spit once more.

4. April 25.—Outer temperature 15 deg. C. (59 deg. F.)

46.	34.9 deg.
47.	38.1 deg.
48.	Drone going to fly— 36.0 deg.
49.	Young bee on window 33.1 deg.
50.	Young bee on window 35.8 deg.
51.	Young bee on window 34.9 deg.
52.	Old bee on window— 36.5 deg.
53.	Old bee on window— 36.0 deg.
54.	Old bee on window— 39.1 deg. (102 F.)
55.	Old bee on window— 38.0 deg.
56.	Old bee on window— 37.5 deg.
57.	Old bee on window— 37.6 deg.
Brood, white nymphs.	
58.	45.2 deg. (113 deg. F.)
59.	37.8 deg.
60.	38.7 deg.
61.	36.0 deg.
62.	35.5 deg.
63.	34.3 deg.

It is easy to recognize that the brood was cooling, the box being opened and the bees not very numerous.

5. April 26.—Outer temperature 15 deg. C. (59 deg. F.)

64.	Drone on comb — 40.7 deg. (105 deg. F.)
65.	Drone on comb — 37.5 deg.
66.	Drone on comb — 38.5 deg.
67.	Brood, about 14 days old 43.0 deg. (109 deg. F.)

68.—Brood, about 14 days old 43.0 deg.

69.—Brood, about 14 days old (40.0 deg. F.)

6. April 29. Section bees. Outer temperature 14 C. Brood all nymphs with white eyes.

70.—43.1 deg.

71.—40.0 deg.

72.—40.9 deg.

73.—38.0 deg.

74.—39.3 deg.

75.—41.1 deg.

76.—41.4 deg.

77.—40.0 deg.

78.—39.8 deg.

79.—39.7 deg.

80.—42.9 deg. The other warmed

side of combs.

81.—42.2 deg. The other warmed

side of combs.

82.—Drone on comb 35.4 deg.

83.—Drone on comb 40.8 deg.

84.—Drone on comb 45.0 deg.

(113 deg. F.)

7. May 3—Outer temperature 18

deg. (64 deg. F.)

85.—Flying bee 39.5 deg.

86.—Flying bee 40.0 deg.

87.—Flying bee 33.9 deg.

89.—Flying drone, breast 48.6 deg.

(119 deg. F.)

—Through abdomen 35.3 deg.

Through head 36.7 deg.

Brood — Freshly capped worms.

Nymphs with brown eyes.

90.—44.4 deg.

91.—43.7 deg.

92.—45.0 deg.

93.—42.5 deg.

94.—40.9 deg.

95.—40.8 deg.

96.—42.0 deg.

97.—40.8 deg.

98.—43.7 deg.

99.—42.6 deg.

100.—43.2 deg.

8. May 7—Outer temperature 18 degrees C. (64 deg. F.)

101.—Queen, gray, with white

wings, taken out of cell 38.6 deg.

102.—Queen, white, the cell

opened 40.5 deg.

103.—Drone 40.7 deg.

104.—Drone 45.9 deg.

105.—Drone 38.2 deg.

Brood—Nymphs with white eyes, W; nymphs with brown eyes, B.

106.—38.9 deg. W.

107.—40.5 deg. W.

108.—42.1 deg. B.

109.—44.2 deg. B.

110.—39.8 deg. B.

111.—30.5 deg. W. (The brood begins to cool.)

112.—37.5 deg. W.

113.—36.9 deg. W.

114.—37.4 deg. W.

115.—35.5 deg. W.

There is no great difference between fanning, or flying bees. Unhappily, I could not take brood bees, because the disturbance of the few bees was too great to distinguish them exactly. Also, there was not a great difference if the outer temperature was 7 deg. or 18 deg. On account of extrinsic circumstances, I had not the possibility to make the experiments, as they ought, i. e., in the very apiary, where I could operate with strong, normal colonies, I

suppose I should have gotten, especially for the brood, higher figures. But I hope that the same experiment shall be made by others with larger means, with finer instruments. It would be necessary to operate with thinner and shorter needles and with much more sensitive galvanometers. At all events, these measurements are possible and give interesting results. My highest temperature for bees was 40 deg. C. (104 deg. F.), but I suppose this temperature should be still higher in time of the fullest development of a good colony. However, the temperature of bees is not constant and, may vary about 10 deg. C. (18 deg. F.) I observed that the temperature of a caged bee, especially if it is chilled, sinks rapidly. A bee which at 7 deg. C. outer temperature was caged for 15 minutes, showed then only an inner temperature of 9 deg. C.

The maximum of the temperature

of drones is very high—48.6 deg. C. (119 deg. F.), although all my drones were still young ones, and not very robust.

The temperature of the brood is most interesting, the maximum of a white nymph with brown eyes was 45.0 deg. C. (113 deg. F.) and it proves that the brood is indeed producing warmth. It is at the same time giving and taking. For in a temperature rather beneath 37 deg. the brood cannot thrive, but when the surrounding temperature is brought by the brood-bees up to 37 deg. C., then the little worms and nymphs represent little stoves themselves, and as such also produce warmth.

It would be a grateful task to continue those experiments on a larger scale than what in default of the means I unhappily must resign, but I hope that others who have the possibility will do so.

Reuchenette, Switzerland.

BEE-KEEPING



FOR WOMEN

Conducted by Miss EMMA M. WILSON, Marengo, Ill.

War Beekeeping for Women

It is highly gratifying to see how beekeeping is appealing to women as "war work," and I would like to give my happy experience as a beginner for the encouragement of other housewives wishful of obtaining honey for their families, but who doubt their ability to make a success of an apiary.

I started with a swarm of hybrids in a W. B. C. hive on May 28 of last year. It gave me over 50 pounds of delicious clover honey and a fine nucleus as well, which is now strong on eight frames. In June and July I added two other swarms to our little apiary.

These four stocks were fed up in October on pink candy syrup, and were tucked into bed for the winter.

They are now the pride of my life, and as healthy and hard-working as anyone could wish. They are so interesting they almost make one forget there is a war going on, and I confidently expect to take a splendid surplus of honey before the end of the summer.

Some women say they would like to keep bees if they were not afraid of their children being stung. My experience in this has been quite the opposite. The children play all about the hives, being much interested in the busy workers, and only once have they been stung. That was when the little girl tried to push a chilled bee into the entrance of the wrong hive. One bee, only, seemed to object, and risked her life to protect the hive. My little girl held herself still, however, and let the bee pull out its own sting, which we hope saved its life.

No woman who has once known the joy of seeing her own bees

working her own cherished flowers, fruit, marrow and bean blossoms will ever enjoy gardening again without them. Even dull darning may be turned into sufficient excuse for taking an easy chair out by the hives and watching the bees carry honey for the household. And, say—it's a proud moment when your admiring family sits down to tea before your first wonderful dish of honey!—G. C. B. in The British Bee Journal.

School Teachers as Beekeepers

A school teacher says, in the British Bee Journal:

A lady beekeeper, whom I often assisted, sent for me one day. Her garden was surrounded by large trees, and a swarm had settled near the top of one of them, overhanging the road. The gardener, though not a beekeeper, had offered to climb the tree and cut the bough off, but the lady feared to give her permission without first consulting me, lest passersby should get stung by infuriated bees in case anything went wrong. Tree-climbing is not in my line, but if the gardener was willing to make the attempt, and fixed a rope to the branch before cutting it off, I said I saw no reason to fear any bad behaviour on the part of the bees. A start was made at once, and before long the swarm was being carefully lowered, while I stood beneath, waiting to deal with it as soon as the bough came within my reach. In the middle of the operation numbers of boys began to troop by, on their way from their houses to the school, and the process of lowering the branch naturally attracted their attention. We warned them to stand clear lest the bees should come down with a rush. However, the lowering

took some time, and they had to proceed to their lessons before it was accomplished. My piano pupil arrived in the meantime and stopped to see the finish. At length the bough was carried into the garden, and the bees shaken off successfully in front of the prepared hive. Other swarms came from this apiary during the summer, all of which pitched on high branches, so that we got quite familiar with the tree-climbing business. I suggested the use of water as a preventive, but the bees always managed to forestall their owner and be well on the wing before she was aware they were out.

One day, when cutting out queen-cells, for this lady to prevent after-swarming, I noticed a fine young queen crawling among a number of cells I had laid upon a lift by my side, and presumably just emerged from one of them. Miss B. picked her up to show to a friend in the house, but let her escape. She took wing, and circling round and round at a great height, at length appeared to get tired, and began to come lower. My companion extended her arm, intending to catch her, when the queen calmly came to rest on the outstretched hand, and was secured.

tensive beekeeper in Monterey County. He was a native of Michigan and was 76 years of age.

An Illinois County Association.

The Henderson County Honey Producers' Association met at Oquawka, Ill., August 3 and elected the following officers: R. R. Banta, President; J. L. Akin, Secretary-Treasurer. The objects of the organization are to co-operate in securing a more nearly pure race of better bees, an increased quantity of honey, and to establish a uniform price for our product, both to the producer and consumer.

R. R. BANTA, Pres.

MISCELLANEOUS NEWS ITEMS

Michigan State Meeting.—The date of the annual meeting of the Michigan State Association has been changed to November 19, 20 and 21, at Lansing. Correspondence concerning this meeting should be addressed to B. F. Kindig, State Inspector, East Lansing, Mich. A large attendance is expected.

North Carolina State Meeting.—The third annual meeting of the North Carolina State Beekeepers' Association is to be held in Asheville, Thursday, October 17. For particulars, address Dr. Franklin Sherman, Chief Entomologist, Raleigh, N. C. A large crowd is expected.

Death of Texas Pioneer.—Charles J. LeStourgeon, a pioneer of Texas beekeeping, died in Medina, Texas, on the morning of July 29. He was 75 years of age. Born in Western Illinois of French Huguenot stock, whose settlement of New France antedated the American Revolution, he emigrated to Texas in 1871.

Beekeeping always had a fascination for him. There being little opportunity of obtaining the new movable frame hives at that time, he and Wm. P. Hough started a factory near Floresville, Texas. They first manufactured the Van Dusen upright hive with a glass observation window and removable brood-chamber. Afterward the superiority of the Langstroth simplicity hive caused him to adopt it. Through his efforts the Langstroth hive became the standard for early Texas beekeepers. Mr. LeStourgeon was a beekeeper up to the time of his death.

He leaves, besides the widow, three sons and two daughters. One of his sons, E. G. LeStourgeon, is Manager of the Texas Honey Producers' Association.

Spray at Blossom Time Kills Bees.

—The following circular is received from T. R. Johnston, Assistant County Agent Leader, at Lafayette, Ind.: "Experiments have been under-

taken at Purdue University by the Entomology Department to show the effect on bees of tree sprays applied at blossoming time to control the codling moth and other insects. The first step of the experimental work, which is to extend over a two-year period, has been completed and indicates that the spray on the blossoms kills the bees.

"Through the feeding of bees and analyzing of their bodies it has been found that it requires only .0000005 (five ten-millionths) of a gram of arsenic to put them out of business. In other words, the small amount of arsenate of lead used in the spray, if applied while the blossoms are open, means that the bees will gather no more nectar after visiting a few blossoms.

"Practical beekeepers and orchardmen in Indiana disagree on the question as to the effects on bees of spraying at blossom time. Analysis of the bees killed by arsenic and observations at spraying time this spring indicate that the spray is fatal to the buzzers. Sprays should not be applied while the blossoms are open, but wait until after they have fallen."

The National.—The next meeting of the National will be held at Chicago, date and program to be announced later.

A Wrong Address.—Those who know Friend Gilling's opinion on the liquor question will appreciate the following: "The telegraphic address of the Honey Producers' Association is 'Bees,' but owing to some men not beeing very good writers, a number of wires reached our friend addressed 'Beer.' Hawera and the customs people are trying to find an illicit brewery in the district."—New Zealand Beekeepers' Journal.

Necrology.—Mr. John Witham, a noted apiarist of Monrovia, Calif., died July 15 at Palo Alto. Mr. Witham was at one time a very ex-

Preparing the Bees for Cold Weather.

1. Unite any weak colonies to make colonies of normal strength. 2. See that every colony has sufficient food stores of good quality to last during the winter—25 to 30 pounds are necessary. 3. Provide adequate protection against the wind and pack the hives well, as described in detail below:

Beekeepers lose from one-tenth to one-half of their colonies every winter by failing to feed and protect them properly. That loss is too large, bee specialists of the U. S. Department of Agriculture believe, and in a statement issued they declare these losses of important sources of sugar can be reduced to less than 1 per cent.

Wintering bees is a problem of conserving the energy of the individuals in each colony, the bee specialists say. Three conditions in the hive cause a waste of energy. First, when the temperature of the air surrounding the bees falls below 57 degrees it is necessary for the bees to expend energy to keep warm. Second, when the temperature of the air is above 80 degrees the bees use energy by flying from the hive, removing the dead that may have accumulated, and in any other activities which the needs of the colony require. Third, an abnormal activity resulting in energy loss is caused by long periods of adverse weather which do not permit the bees to fly from the hive to void their excrement. This last condition may result in the death of many thousands of colonies, the specialists say.

Protection of the hive and providing of foods of good quality for winter stores will conserve the energy of the bees and enable the colony to pass the winter safely outdoors. If the hive is placed within a box about 6 inches greater in each dimension than the hive itself, and the space between filled with dry sawdust, leaves or other insulating material, the necessity of heat generation by the bees is reduced to a minimum. A small tunnel through the packing material will make a passageway for the bees to the entrance to the hive.

Care must be taken to see that the hives have proper food stores. Food such as honeydew honey or honeys with a large percentage of gums, which may cause a rapid accumulation of excrement in the bees, are un-

desirable, but may be corrected by inserting a frame of honey in the middle of the brood-chamber after brood-rearing has ceased. Another remedy for undesirable stores is to feed about 10 pounds of a syrup made of 2 parts granulated sugar to 1 part of water. In either case, when such food is given after brood-rearing has ceased, it will be placed by the bees in positions most available for immediate use, and the poorest food stores saved until spring. When the

air surrounding the bees is maintained at about 57 degrees, and no other irritating factor is present, the bees live so slowly that very little food is consumed, the colony being almost in a dormant condition. A normal colony of bees thus protected and fed not only will endure six months or more of confinement, but have sufficient vitality left to be useful when spring comes.

Washington, D. C.

DR. MILLER'S



ANSWERS

Send Questions either to the office of the American Bee Journal or direct to
DR. C. C. MILLER, MARENGO, ILL.
He does NOT answer bee-keeping questions by mail.

Swarms

1. Someone advises to treat against swarming as soon as the eggs in cup are noticed. I have tried it and feel that I do not like it. Now, will you state just how the colony must appear inside for you to apply the "put-up" or other procedure for the same purpose? Let there be considered four stages, to-wit: (1). Egg in cups. (2). Young uncapped queen-cells. (3). Same as 2, but just about as big as capped. (4). Capped or sealed. At which of these stages do you operate? If you notice 1, 2 or 3, do you do anything, or just let them develop?

2. When you make nuclei with 3 or 4 frames, about what per cent are successful with first attempt?

3. Would you do anything in particular if you noticed rather commonly on the lower rim of brood-frame, capped drone-comb above worker-comb honey?

4. A week or so ago I received one-half dozen queens. I divided that many colonies; queen with very little brood on old stand; most all the brood and the new queen on a new stand. Today I found the latter with very small queens, and in each of that three a lot of queen-cells. I concluded to leave in each of them the best queen-cell, without interfering with the queen. What do you think of that?

5. The following has happened: I had a swarm; secured it put the swarm on the old stand and the parent hive on a new stand. Some time after, that parent hive swarmed, but on investigation (I secured the swarm), in neither hive could anything like a queen-cell be found. Yesterday that same "parent hive" swarmed again. I secured it and today found just the same state of affairs. That "parent hive" by the swarming is resplit, but in neither part was there any queen-cell or anything like it. Another queer thing to me is, the swarm I put on the old stand (the last one to swarm), and parent hive No. 2, located aside, has many more bees than the hive I put on the old stand. To the last of these I gave queen-cells. Today another hive swarmed, also arisen from brood put on a new stand. I secured it and put the swarm on the old stand and the other part next to it. On finishing the work of the day I looked at these two, and again found that the hive aside has many more bees than the swarm proper placed on the original stand. In the parent hive of this I neither found anything of the nature of a queen-cell. I did not look through the swarm, as I did not care to disturb it so soon after hiving.

PENNSYLVANIA.

ANSWERS.—1. The first time around, everything in the way of a queen-cell is killed, whether it be an egg in a cup or a sealed cell. On the next round, perhaps ten days later, if the case comes under your 1 or 2, the cells are killed, and same thing upon succeeding rounds. In other words, no treatment is undertaken so long as nothing but eggs or quite young larvae are found. At any time after the first round, cases 3 and 4 are put under treatment.

2 About 100 per cent, if you mean success in forming the nuclei and having the bees stay

on their new stand. If you mean the number of cases in which the young queen succeeds to the point of laying, I should guess somewhere in the neighborhood of 75 per cent.

3. The drone-comb should be cut out, even if nothing were done but to leave the vacancy to be filled again by the bees with drone-comb; but it would be better to fill up the vacancy with a patch of worker-comb.

4. It often happens that a queen will not at first be allowed to lay, and if looked after a few days later the queen may be found missing, or she may be found laying. If she is still alive, I think her chances for continued life will be better if all cells are killed. A good many times cells will be started when a queen is introduced, and then the bees, if left to themselves, destroy the cells. It was entirely natural that the queens should be small so long as not in full laying.

5. When an afterswarm issues, there should at least be found an empty cell from which the queen emerged. If none was really present, it looks as if it might be that the bees swarmed out with the virgin on her wedding trip. I don't understand why more bees should be in the old hive than in the swarm, unless enough time had elapsed for a force to hatch out, although there might be such a thing as part of the swarm returning.

Raising Queens

I have a suggestion as to raising queens which may be helpful to someone, and I have not seen the plan in print. I have several queen-excluders covered with wire screens and several hives with a three-fourths-inch hole bored in one end, with a piece of tin tacked under the hole and bent down for a doorstep. When I find a queen-cell I want to save I put my screened excluder over any colony I may select with my hive with a hole facing the front on top and raise two or three frames of brood from below, or from any source desired, and give them the frame with the queen-cell. When the queen is hatched and mated I can use her when I please, and removing my screened excluders leaves the colony intact. I find three advantages with this manipulation. 1st it is simple and convenient to assemble with no extra equipment. 2nd, colonies are not broken up to form mating nuclei, and, 3rd, if the new queen is raised over the colony where we wish to requeen, all we have to do when the young queen gets to laying is to remove the old queen and put the young queen and bees from the upper story in the lower story, with no introducing necessary. There is another advantage, in cool weather the bees from the full colony below help to keep our nuclei warm.

NEW YORK.

The plan of rearing queens above a colony with a laying queen dates back some years, and is mentioned by Doolittle in his book on

queen-rearing, written more than a quarter of a century ago. But the fact that one engaged in beekeeping several years has not seen it in print shows that it does not enjoy the publicity that it deserves, especially considering the advantages enumerated by our correspondent.

In the practice of others, the bees in the upper story are not entirely shut off from communication with the bees in the brood-chamber below, all that is necessary being an excluder over the brood-chamber. Indeed, in the first case on record there was not even a queen-excluder; four or five stories of empty brood-combs were piled upon a brood-chamber and a frame of brood put in the upper story. The bees reared a queen from the brood given, the queen laid, and a brood-nest was established.

Neither is it necessary to bore a hole in the upper story. The cover of the hive may be shoved forward enough to allow passage for the queen, or the body itself may be shoved forward to make the passage.

It seems to be a matter of some importance that the brood be as far as possible from the lower story containing the queen. If brood is put into a story immediately above the excluder, the chances are that no cells will be started, although if cells already started are put there they are likely to be rejected.

It should be added that not all are successful in getting queens to laying in an upper story at all times, the queens disappearing about the time they should begin to lay.

Mismatched Queens

Last summer a swarm issued from one of my hives. They were pure Golden Italian bees. I think the old queen was lost, because they tried to swarm before, but came back. A week later they swarmed again. I hived them in a new hive and a week later I examined this hive and found the queen. I think that she was a virgin that went with the swarm, because she was so small. The old queen was so large. Now there are bees in the hive that are black, some three-banded, and some golden bees. I wintered them in a two-story hive. They are now in excellent condition, as they have thirteen frames that have brood and plenty of honey and bees. I think the queen is mismatched. The bees are cross and not very quiet on the comb. Do you think that requeening would be all right? She is a good queen and I hate to kill her, on account of her prolificness. The bees are continually fighting at the entrance. Do you think it is their own bees, or robber bees? What would you advise me to do? MINNESOTA.

ANSWER.—You are correct that the queen has mated with a drone of undesirable stock. But as she is doing such fine work, I think I would leave her undisturbed, at least until near the close of the season, provided you can stand the crossness of the bees. I don't know just what to think of the fighting at the entrance. It is more likely robbers than bees of the colony fighting among themselves—indeed the latter is not at all likely—but it seems strange that it should be a continuous performance, especially since the colony is strong.

Uniting

I have been told that to unite weak colonies of bees in the spring makes them no stronger. You say unite in the fall. Please write in the American Bee Journal explaining why it doesn't do in the spring to make one or more out of many weak ones and best plan to do so. If a hive is reasonably strong in the fall and hives to spare, which do you recommend, smother what you don't want, or unite?

ONTARIO.

ANSWER.—If in the spring you unite two colonies that are weak and in good condition, the united colony will be stronger than either of the separate colonies was. But if you have one or more colonies that are what are called "dwindling," and unite them together, the united colony seems to dwindle in a short time to as little as either of the separate colonies, if

not less. Just why it is so I don't know.

The best way to unite two colonies is to put over one of them a sheet of newspaper, and over this set the other hive without any bottom. The bees will gnaw a hole through the paper, get together gradually, and unite without quarreling.

If I should want to make the number of colonies less in the fall, I would do it by uniting.

Time to Catch Drones

1. When is the proper time to catch drones? I had two swarms come off, and the old one was full of drones; so I used the drone-trap and destroyed them.

2. One swarm came off three times and went back each time to the old hive; so I trapped all the drones and queen and they seem fine now. Why did they go back so many times; the hive was a new one, with fresh starters.

3. If I have a new idea along the bee fixture line that I know is a good one, at least a big time saver, how am I going to protect myself so as to put my plan out for investigation and not have it taken away from me, and if other people think it O. K., then have it patented?

MINNESOTA.

ANSWERS.—1. You did all right, but the best time to catch drones is before they are born. Use full sheets of worker foundation, so there will be no chance to rear a lot of useless consumers. If you already have combs containing drone-comb, a good plan is to cut out the drone-comb and fill its place with patches of worker-comb.

2. I don't know why it is that a swarm will sometimes return and then issue again; possibly in some cases because the queen has difficulty in flying with the swarm; and in some cases it may be that a virgin may make her nuptial flight. I don't suppose that trapping the drones had any effect in making the bees stay.

3. Beekeepers are a considerate lot, and anxious to give credit where credit is due. But if you expect to patent anything, it should not be published in advance. One way is to submit your plan to some experienced beekeeper and get his opinion about it. But it's dollars to doughnuts that when a raw recruit has made a valuable discovery it will turn out to be something known years ago.

Swarming—Foulbrood

1. When a prime swarm issues from a hive, will another come out if I cut all remaining cells but one and leave the old hive on the same stand?

2. I hived a new swarm and put it next to the old stand and moved the parent colony on the eighth day. A few days afterwards a second swarm came out of the old hive. Why was that?

3. I have a foulbrood colony. I found the queen, put her on a healthy brood-frame from another colony, filled out the new chamber with foundation and placed the diseased colony over an escape-board on top of new chamber, so as to get the bees out of the diseased hive. Will that cure them?

4. Can I hive a prime swarm on starters, cut out all cells and place old brood-chamber on top of swarm and make the new swarm stay and work for extracted honey in top chamber without swarming again?

NEW YORK.

ANSWERS.—2. It was an exceptional case, occurring because the old colony had become so strong it thought it could afford to swarm. Usually the first afterswarm issues something like eight days after the prime swarm, and moving the hive just before the afterswarm would issue puts the colony in too discouraged a condition to swarm. "A few days afterward"—sorry you didn't say just how many days—gave time enough for the colony to recuperate. Eight days and then "a few days" more between the prime swarm and the first afterswarm is something quite unusual.

3. Possibly it may if the case is European, not if American.

4. Yes.

Purple Martin

Do purple martins eat bees? I recently purchased several colonies of bees and have been told that the purple martins eat bees. If they do I regret it very much, as I have some 30 or 40 pairs of martins that build on my place every year. Personally I do not believe that they do eat bees. What I mean by the purple martin is the martin that comes each summer and builds in boxes or gourds prepared for them, raise their young and immediately go south again. I don't know whether or not these martins go as far north as Illinois or not. The male is a black purple all over, while the females have a gray breast. All over the south boxes and gourds are put up on poles for these martins to build in and they will not allow a hawk to come near where they are raising their young. They make a peculiar clucking sound entirely different from the noise made by any bird. They are not the bee martin, or what is known as the king bird.

ALABAMA.

ANSWER.—I am sorry to say that the purple martin (*Progne subis*) is a rather rare bird in the extreme northern part of Illinois, where I live, although plentiful in my boyhood home in western Pennsylvania, while it lived mostly—I rather think altogether—in little houses or boxes built specially for it, and put up on the tops of poles or else on buildings. I think you are entirely right in counting it innocent of the slaughter of bees.

Hoffman Frames—Foulbrood

1. Why are the bottom-bars of the Hoffman frames so narrow? I should think it would be better to have them as wide as the end-bars.

2. What causes foulbrood, both American and European? Now don't tell me it is caused by feeding foulbroody honey, for I know that will cause it to spread, but what are the conditions that are favorable for the breeding of the germs that cause it?

3. Would there be any danger in feeding wild honey that is so contaminated by bark, rotten wood, etc., and is unfit for table use, if it is gathered by healthy bees?

PENNSYLVANIA.

ANSWERS.—1. I am not sure what are the principal reasons for narrow bottom-bars. One reason may be that the frames are sometimes used to hold extracting-combs, and a narrow bottom-bar is less in the way of the uncapping knife. I am rather partial to frames having end-bars and bottom-bars the same width as top-bars, and have been using them for years.

2. A microbe is the villain that starts the trouble, just as seeds of weeds make trouble in the garden. A weak colony and a weak strain of bees is favorable to its growth. A strong colony of bees with a pure Italian queen is favorable to prevention, and some think that such bees will almost entirely prevent the encroachment of European foulbrood.

3. Such honey will be all right to feed to bees.

Artificial Increase

1. In your October, (1917) number Mr. Pellett describes a method of artificial increase which I propose to try out next year, if I can be satisfied on one point, viz.: What becomes of the field bees which come and go through the augur hole in top story when this story is moved to a new location? In Mr. Pellett's example 44 days intervened from time of placing story on top and removing same. All brood in this story would, therefore, have hatched, and there should be a great quantity of field bees which know no other entrance than the augur hole. When top story is removed I should expect quite a swarm looking for that hole. Is it likely the bees will find the entrance to the hive below, and, if they did, is there not danger of them being regarded as intruders by the bottom colony, as the two hives have really been separated for a long time? This, of course, could be overcome by plugging the hole after the queen had been mated, when top bees would be forced to exit below. However, as that is not suggested by Mr. Pellett, I should like to know what happens.

2. Do you recommend two stories for wintering, as described by Mr. Romain on page 579 of your November (1917) number? I propose trying this plan next winter, if you think it O. K., but would utilize half-stories, not

having sufficient full-depth stories. Do you adopt the plan?

BRITISH COLUMBIA.

ANSWERS.—1. You are quite right; when the upper story is set on a new stand all the field bees, upon their return from their first trip to the fields, instead of going to their new home will go to the old location. I've watched with much interest their behavior when they find their accustomed entrance gone. They fly about the place for some time in evident confusion and distress, and finally settle in a cluster upon the part of the hive nearest to where they think their entrance should be. After a time some bee of inquiring turn of mind begins to explore for an entrance and finds the nearest one, even if none is nearer than the regular entrance at the bottom of the hive. Then she sets up a call, and it isn't very long before a line of march is started and the whole outfit make their way to the entrance. There is no quarreling; if the bees have been separated only by an excluder they will have the same hive odor. Even if entirely separated, as I have often had them, there will be no quarreling, probably because the bees coming from the field bring a peace-offering with them.

2. Wintering a colony over an empty hive is a plan in use many years ago, being especially championed by Rev. W. F. Clarke, and I don't remember that anyone who used it ever reported anything objectionable in it. I don't use the plan, as I winter in the cellar.

Raising Queens—Requeening

1. Is it more assured to attempt making a colony queenright by giving a frame of eggs for same to raise queen-cells than it would be to give a queen-cell from another colony?

2. In a publication I have, it is stated that a good way to requeen is to place a hatching queen-cell in the "super" of the colony to be requeened and paying not attention to the "inferior" queen below; chances being that the virgin will kill the old queen "below." Is it necessary for the above to have a super on the colony, supposing one is mostly in comb honey, and therefore having supers unfit as stated, does it do as well to insert in the brood-chamber a frame from another colony having a queen-cell? Two of my colonies had just one capped queen-cell. As eggs were there I presume the colonies had queens. Do you think they would have requeened without swarming from that one queen-cell? In each case the queen-cell was raised by the colony in question.

PENNSYLVANIA.

ANSWERS.—1. I cannot answer too positively, but I suppose that bees conscious of their queenlessness have as much respect for a queen-cell, sealed or unsealed, that is given from another colony, as they do for one started from an egg or larva of their own brood. It is possible, however, that you might be a little more sure of success by giving a frame of eggs and young brood than you would by giving a queen-cell, for bees are somewhat notional, sometimes tearing down cells, even of their own building, when you can see no good reason for it.

2. If a queen-cell were put in a super, with no excluder under, I would expect in most cases that the virgin would be killed upon entering the brood-chamber. If, however, the old queen were one that the bees were about to supersede, the virgin would likely be allowed to take her place. If a frame having a queen-cell, from another colony, were inserted in the brood-chamber, the bees would pretty certainly tear it down unless they contemplated either swarming or superseding. In the case where there was only one queen-cell, and that sealed, it's a very safe guess that superseding was intended, and not swarming.

Apiary on Shares

I am writing to ask what is customary in a contract where one leases ground for the purpose of placing an apiary, the rent to be

taken out in pounds of honey. How much honey should the owner of the land expect?
KENTUCKY.

ANSWER.—There is no rule, and no two cases are exactly alike. One man wants the bees on his place for the good they will do in the fertilization of fruit blossoms or other blossoms, and he wants no pay, and indeed would pay something rather than not have them. Another is not interested in bees, is afraid of them and wouldn't have them on the place for any price. In one case a fixed price of \$5 or \$10 a year is paid; in another 5 or 10 cents a colony. In one case where land is of very high value, the rent should be ten times as much as upon land of little value. If honey is given as pay, its honey value should be considered. A certain per cent of the crop might be given; one or more pounds for every hundred. In any case, if the site is desirable, the compensation should be such that the owner of the ground shall be more than satisfied, and shall want a continuance.

Robbing

Why does a strong colony of bees with a good queen and plenty of eggs let other bees carry out their honey? How can I prevent it?
MICHIGAN.

ANSWER.—It is doubtful whether a strong colony in good condition was ever robbed unless the beekeeper did some fool thing to start the robbing. When honey is coming in plentifully there is little danger of robbing; but when the flow stops, look out. Don't open a hive unnecessarily and give the robbers a start. If a weak or queenless colony is attacked by robbers, if you take it away, leaving nothing in its place, the robbers may pitch onto a strong colony close by, and overcome it. So leave the hive in its place until they have cleaned it out, or else put in its place another hive with empty combs, or perhaps a little honey, and when they have cleaned that up they will go about their business without troubling the strong colony. Be careful about spilling honey or leaving bits of comb with honey lying around.

Swarms

Does a prime swarm have swarms the first year?
WISCONSIN.

ANSWER.—When you have a swarm, you may feel pretty safe against its swarming before the next year. Occasionally, however, a swarm does itself throw out a swarm, which is called a virgin swarm.

Clipped Queens

1. Referring to your answer No. 2 to Idaho, in June number of American Bee Journal, I ask how would the owner know in the evening or later that the colony had swarmed?

2. If the queen had been clipped instead of being kept in the excluder, how could he know?

3. If the queen is not clipped and no excluder is over the entrance, can it be learned whether a colony has swarmed or not?

4. I have sufficient drawn combs for this season, but many are imperfect. I wish better ones for next season. The best of the flow will soon be over, but some nectar will be coming in till frost. Is it practical to get these combs drawn from full sheets of foundation this season, and if so, what is the best way?

ANSWERS.—1. If an excluder is used at the entrance it will be in the form of a queen-trap. Her presence there is sure proof that the bees have swarmed.

2. When the queen is clipped and the swarm issues, it generally returns upon finding the queen is not with it. In that case, it is not easy to tell that a swarm has issued, and only a guess can be made if sealed queen-cells are found in the hive.

3. Only guessing can be done; but if the colony seems weakened in bees, and dead cells

are found in the hive, swarming may be guessed.

4. Comb-building can be induced only by a natural flow or feeding. If there is no natural flow the feeding must be heavy, and it is hardly worth while to try to get comb built when the bees are not getting enough from the fields to get honey to put in the combs they build. For there is no way to get the bees to build comb that is not immediately put to use either for brood or honey.

Introducing Queens

What do you think of the following?

1. Two queens were bought and were placed with most all the brood of the respective colonies on June 24. Queens were accepted and eggs found on first examination. In colony No. 1, on the 7th of July, were many cups with eggs and queen-cells very young; the queen was present. Colony 26 did not have a queen but had a solitary capped queen-cell. To both colonies comb supers were given and good work done therein.

2. I took a queen from colony No. 2 and soon found a queen-cell. After while I found another just like it. The colony has not swarmed as yet. When I went to destroy the queen-cell I liberated a queen. She came out of the cell as I went at it. I put her in colony No. 34, which I had noticed was queenless but had a capped queen-cell. What do you think will become of colony No. 2 and No. 34?
PENNSYLVANIA.

ANSWERS.—1. Colony No. 1 had queen-cells present a week after the introduction of a new queen, the cells containing eggs or brood of the new queen. That's a thing that happens quite often when a new queen is introduced; and I think such cells are usually destroyed by the bees, but sometimes they are left and the queen superseded. In the case of colony No. 26, supersedure evidently took place.

2. Judging from the empty queen-cells present, the probability is that a free virgin was in colony No. 2, which will be laying in less than two weeks. The virgin given to No. 34 was probably killed, having no effect whatever on the condition of the colony.

Swarm Prevention

1. I had a colony in an 8-frame hive that wintered well. On May 5 I took an empty hive-body, put full sheets of foundation in it and put it under the brood-chamber, thinking they would not swarm; but they did not work down. On June 13 they sent out a swarm; it was hived and put on the stand of the parent colony, moving the parent colony so there was about 3 feet between them. Was that too far?

2. I would like to know why the bees didn't work down in the extra hive-body I gave them. Was it too late in the season?

3. The swarm that came out June 13 was given supers 2 days later, but on June 25, 12 days after they were hived, they sent out a swarm, and on July 5 a second swarm. How can you account for that, so soon after they were hived? I gave them one frame of brood when I hived them, the rest full sheets of foundation. This is the first time I have tried to exchange places with the swarm and the parent colony; it kept the parent colony from swarming any more, all right, but what was gained?
MICHIGAN.

A—ANSWERS.—1. Yes, it was too far. You should have set the swarm on the old stand and the old hive as close to it as possible without touching; then, 7 or 8 days later, moved the old hive to a new stand 10 feet or more distant.

2. I don't know why they didn't work down. Looks like pure cussedness, for any decent colony ought to have done so. As you gave them the extra room below May 5, and they swarmed June 13, it looks as if there was no excuse for them. Like enough you will not find it happen so again.

3. Giving that frame of brood may have made the trouble. Some think it advisable to give such frame, and then take it away after 2 or 3 days. In this particular case perhaps little was gained, but generally there will be a decided gain, for a strong force of bees will

be on the old stand to do good work in supers, and even as it was it was a gain not to have the old colony split up into weak afterwarms.

Sweet Clover—Alfalfa

1. On page 85, American Bee Journal for March, 1918, we are told that "when cut for hay, sweet clover should be mown before it begins to bloom to any extent." But, alas for the poor bees! If this is the practice, what is the use of the plant as bee forage?

2. I bought some buckwheat seed and tried out a small patch for my bees. The blossom is white, and although the plants have been in full bloom for two weeks, not a bee visits them, nor has the blossom the slightest odor. My man, who at one time lived in Kansas, says the buckwheat there is a pinkish purple blossom, and a marked odor. Apparently I have gotten hold of the wrong kind. Can you give me the botanical name of the variety the bees visit?
BRITISH COLUMBIA.

ANSWERS.—1. Don't worry. In the west, where alfalfa honey is produced by the carload, the same rule holds, and alfalfa must be cut for hay before the bees have much chance at it, but one way and another it turns out that the bees get carloads. Some of it is left to grow for seed, and of course the bees get the full benefit of that, and some cut for hay will by some means be cut a bit late—well, you see, the honey is gotten, somehow. You'll find it the same way with sweet clover.

2. Your buckwheat is almost certainly all right. Whether you have Japanese, Silver-hull, or just common buckwheat, it's all *Fagopyrum esculentum*, and honey-yielding. I think you would call the blossoms white that grow here, although some of them may have a pinkish shade, and it is possible that in other regions the blossoms may be pink. Like most honey-plants, there are seasons when no nectar is yielded. I think, too, that it is rather early for it to yield well if it blooms in the first half of July, as it is considered not advisable to sow buckwheat before about the first of July.

Ownership of a Swarm

If my bees swarm and go on some one else's property, whom do they belong to?

ANSWER.—If you follow them right up you can claim them.

NEW YORK.

Put-Up Plan

The way I do, the Put-up plan might be better called the Put-aside or Put-away plan. I do not like to set one hive on the other, so at first I set the hive with the queen in it aside of the parent hive; but as I thought that the bees in the "aside" were not staying well (flew over into the old hive), I set the hive with the queen quite a ways off. If I would grow to a thousand years I would not hunt up queens, nor endanger them by handling; so I separate the queen by setting the parent hive off the stand and put the empty new hive in its place; then put into the latter a frame with little brood, another with honey, and also one with empty comb, and may add some frames with foundation. On all that I place a queen-excluder, and in front, up against entrance, a large board, and on that I brush the bees out of the parent hive; then place latter upon the excluder. Then I brush the bees on that board at the entrance, and the bees walk into the hive-body below. In the evening, or morning, I set aside the parent hive, and then pick up the new hive with the queen in it and set it away on a prepared stand; then put the parent hive on the old site. At the time I put the frames of brood into the parent hive I do the best I can to destroy all queen-cells but the best one. Three or four days later I look over the frames in the parent hives again for destruction of all but the one best cell.

Thus I rarely have any other than good luck in securing the queen in the hive. The only trouble is, that in the hive on the old stand, the new queens seem not forthcoming, and the bees act queerly; they swarm, come back, and in one case repeated that, and both times after that action, on examination, there seemed to be neither eggs nor queen-cells. I really expected eggs only 12 days after the operation of dividing. My hopes were that thus the parent hives would find themselves with

new queens instead of by returning the old queens. Is my way right, by rule? If so, why does it not work?

This way looks to me just about the same as Fred W. Hall's whom you call a good beekeeper in answer to the first question in July American Bee Journal, page 243.

The way I secure lots of bees for the hive I set off is, that before I take away that hive I shut up the bees in it by a special contrivance of my own of wire netting (no stuffing up with grass for me), then in two days I remove the wire netting affair, and thus there is no lack of bees with the queen in the set-away.

PENNSYLVANIA.

ANSWER.—One of the pleasures of beekeeping is the constant opportunity to try new things and to do things differently, generally finding them turn out failures, but occasionally scoring a success. It's a good thing, but a good thing may be carried too far, and in your beekeeping you're an ultraist of the ultraists. If anything is common practice among beekeepers, that's reason enough for you to be forermost in it. If they stuff grass in entrances, it's "no stuffing up with grass for me;" if they hunt up queens, it's not for you in a thousand years, and you'll go to twice the trouble to avoid it. If you keep on, some day it will occur to you that most beekeepers use hives with 8, 10 or more frames, and you'll decide to use only five, and then want it explained why you don't get bumper crops. I can sympathize with you in your discouragement. I've tried fool things enough to make quite a book, and felt the chagrin of failure; but when we find, as you say, "nothing works," we can quit doing so many things differently, do the same as others do and then there's no reason why we should not have as good success as they.

You can put the hive with the queen on a distant stand, and I sometimes do so if only a frame or two of brood are taken with her, but if a considerable amount of brood and bees is taken with her I prefer to put up on top, so as to keep the whole force of bees with the colony at the old stand; for if set for some days on a separate stand a goodly number of field bees would be left at the new stand.

As to the bees swarming out, it may be that you left more than one cell. Often a queen-cell is so hidden that one must be an expert at finding cells not to miss it, and if two cells are left in the hive the bees are practically certain to swarm. It is possible, also, that when the young queen went on her wedding trip the bees swarmed out with her.

My understanding of F. W. Hall's plan is that he removes the old queen and then destroys all queen-cells but one. That gives him the great advantage that he has a young laying queen in each hive, and the chance of such a queen swarming is a negligible quantity. While the plan is excellent in that respect, it is not every one who would want to adopt it, for it has the disadvantage of a rather bad break in egg-laying, from the time the old queen is killed until the young one begins to lay, which may be as much as three weeks. Those who are working for constant improvement of stock will also object that the annual renewal of the queen does not favor the full testing of each queen so as to allow the selection of the best as a breeder. Mr. Hall is a very pleasant gentleman as well as a successful beekeeper, and when he sees this, if he finds any misrepresentation I shall be glad to be corrected by him. But the Hall plan is hardly for you, since hunting up queens is an essential part of the plan.

Queens—Feeding for Winter

1. I bought a nice queen bee in June of this year and she came in good shape, as far as I know about bees. I put her in a new colony,

which had been 10 days without a queen. About four or five days later I looked in to see what she had done and found that she had laid a lot of eggs, and in some of the cells were two eggs. I looked in again on the 17th and found that the queen was there, but not a single egg had been hatched out. Why is it that they will not hatch out? Do you think that the eggs will hatch this summer?

2. I also bought another queen, and I put her in the colony which I had just made queenless, and the bees received her all right. She has been in the hive for about 14 days, but has not laid any eggs.

3. I also find that my bees will not get more than 3 or 4 combs drawn out this summer. I put each swarm of bees on ten full sheets of comb foundation to each hive. Should I leave the undrawn sheets in each of the hives, or must I take out what is not drawn out and put them away until next spring?

4. My bees have not gathered honey as yet. The cotton is blooming here and it will bloom until about frost. I do not want to feed my bees until I have to. We have frost in the middle or latter part of October if we have an early fall, and if we have a late fall it will be about the first of November before frost will set in to kill all kinds of crops that bloom. About what time in the fall would you start feeding my bees for the winter?

5. Can you furnish me honey to feed them on, and how much to each hive will it take, and at what price, or would it be better for me to feed sugar syrup? If sugar is used, how much should be used to the hive? Should it be cooked to a thick syrup? Will three-fourths syrup and one-fourth honey be a good feed?

6. Will I have to buy a feeder, or can you give me a good plan as to how to make a good feeder? I am thinking of putting on an empty super and having a tin box made, say about 12 or 14 inches long, 10 or 12 inches wide and 2 or 4 inches deep.

7. If any of the honey or sugar syrup runs out in the hive out of the feeder, will it drown the bees or cause robbing?

NORTH CAROLINA.

ANSWERS.—1. I have had a very few queens in my lifetime, perhaps not more than two or three whose eggs never hatched, I suppose from some defect in the queen. I don't suppose the eggs of this queen of yours will ever hatch.

2. Sometimes it happens that a queen is tolerated by the bees a considerable time, although not allowed to lay, and then she may lay all right; or, she may be then killed. I wouldn't be very hopeful about yours.

3. The sheets of foundation that are not drawn out should not be left with the bees over winter. Indeed, it is not best to leave them there now, if the bees are making no use of them, for they are likely to daub them with bee-glue, and I have known them to daub foundation so badly that they would never draw it out afterward. So if they are making no use of it, it will be well to take it out until honey is yielding again, or until you feed.

4. It would be better to feed before everything is frozen; but as you say you do not want to feed until you are bound to, you may as well wait till after frost, whether that comes early or late.

5. It is quite possible that your bees will get enough for winter from the late flow, but if not, I think Dadant and Sons can supply your needs, but would hardly be able to quote a price until later. Each colony should have not less than 30 pounds of honey, or its equivalent in sugar syrup; and 40 pounds would be still better. If you feed sugar syrup, it needs no cooking, only so that the sugar is dissolved. But it will dissolve more rapidly if you stir the sugar slowly into boiling water. Whatever you do, don't scorch it if you don't want to kill your bees. For such late feeding, sugar syrup should be thick, say at the rate of 5 pounds of granulated sugar to 2 pounds or pints of water. I would rather have honey than sugar for winter food, although some prefer sugar. At any rate, at the present prices of honey and sugar most beekeepers

would feed at least part sugar. I would very much rather feed the mixture you propose (one-fourth honey and three-fourths syrup) than to feed all sugar. If you feed all sugar you should use a level teaspoonful of tartaric acid to 20 pounds of sugar. If you use one-fourth honey, no acid will be needed.

6. For feeding you can use a box such as you propose, preferably of wood with melted paraffin or wax run around the corners, but there must be something to keep the bees from drowning, such as excelsior or cork chips.

7. There would be hardly any danger of drowning bees with a leaky feeder, but there would be danger of robbing. Feeding after bees stop flying in the evening makes the danger less.

Laying-Worker

This spring I purchased two colonies for \$25. I determined to run principally for experience, with possibly some increase this year.

My first swarm came off June 13, and I hived them on the old stand, gave them a full depth super, full of sheets of foundation. This colony has today two supers, seven frames full, and working like mad. On June 15 I hived what I first thought to be a swarm from my second colony, but on finding a queen in the hive of the second colony as well as with the swarm, I decided that it was an after-swarm from No. 1. I hived them and after two hours this after-swarm took French leave and left me where I was before.

I then, that day, June 15, went through my first colony, the one which swarmed two days before, and found not only the queen, but five or six ripe queen-cells. This certainly put me up in the air, so I decided that right here was where I was going to do my first turn at increase. I took two frames of bees and brood with two cells, put them in a hive with two full sheets of foundation and sat down to await developments. In due time I went through my small nuclei and found both cells had hatched, but was never able to find a queen among them. Otherwise this division appeared to be contented and was bringing in nectar and pollen; however, in a short time I began to suspect laying workers. I found worker cells capped with drone cappings. I could not find queen-cells any place, so I took another frame of brood from the original hive. I had replaced the first two with foundation, and this made three frames taken from this hive. The division, however, did not build any cells on the third frame, and to my surprise, I began to find not only worker cells with drone caps, but also a few worker cells on the first frames with regular worker cappings. Here was another nut for me to crack. I had ordered queen from a breeder, realizing that my chances for a successful introduction was slim, and now I have read in the American Bee Journal for August an article by John H. Lovell on Parthenogenesis, in which the theory is that at times laying workers produce both drones and workers. So now, after what I fear a long drawn out introduction which will likely try your patience, I have arrived at the question.

First—Do laying workers at times produce both drones and workers? If so, what will be the functions of such workers produced from layer eggs?

Second—We are led to believe that bees work largely from instinct, governed largely by work necessary, and are not the intelligent creatures which fiction has sometimes led us to believe; then how do bees, in your opinion, differentiate between infertile eggs laid by workers in worker cells and thus cap them with drone cappings?

These are the questions which are particularly disturbing me, although there are a hundred and one other which would like to know just exactly what is your opinion about. I will not, however, take the attitude of a former questioner who wrote you asking you to ask one hundred and fifty questions and answer them at the same time. I will, however, later buy your book, "One Thousand Questions," etc., and possibly I will find some of them already answered.

I have read several books on beekeeping and without attempting to flatter you, my dear Doctor, I can truthfully say that I never read any book which gave me the keen delight which your "Fifty Years Among the Bees" did.

I, with the rest of the bee world, big and

little, have become accustomed to reading not only in your delightful book but in your correspondence in *Gleanings* and the *American Bee Journal*, your characteristic "I don't know," and also your little joke, "I don't know enough to answer," but you do not fool us any; if you do not know, who does? My opinion is that you probably know as much about bees as any man could who is no older than you are and has devoted practically his whole life to the study; but as a man of high intelligence, you are only resorting to these harmless subterfuges in the knowledge that some of the works of old man Nature are beyond human understanding. For instance, we are led to believe by all writers that certain bees function in certain things at certain times. The "books" say young bees build comb, feed young larvae, do sentry work, etc., and goes on and says that they change and relieve each other at times. I shall not be simple enough to ask you why at certain times or what is the ruling spirit of a colony of bees—in short, who is the "boss," and what prompts these "insects with small intelligence" to do these things so methodically, but I would like to know just the same. In my small way I have found out, however, that they will often do the unexpected, and that "Old Man Experience" is about the best criterion to go by, and sometimes he fails.

W. E. MEANS.

ANSWER.—The story of your experiences, which you call "a long drawn out introduction," is very interesting, and I'm glad you gave it. If your question about workers being produced from the eggs of laying workers had been asked before the appearance of the August *American Bee Journal*, I should have replied that in no case do anything but drones proceed from the eggs of laying workers; but that if by any means laying workers should get into the business of rearing workers, I should expect them to be no whit different from workers in general, as to all their functions. But in the August number, page 270, John H. Lovell says: "It is less surprising to learn that in some instances there are laying workers of the honeybee which can also produce both drones and females." Prof. Lovell is a man for whose assertion I have high respect, and, moreover, he is a man for whom I have a decided liking, although I have never seen him. Yet, in spite of all that, I do not feel inclined to make much change in my answer, nor, indeed, to make any change, except to add, "the exceptions to the rule are so exceedingly rare as to be not worth considering in actual practice." And I feel warranted in saying this from the fact that for a good many years I have been reading a large part of what has been said about bees, and never before have I heard of such a thing as a worker bee being produced from the egg of a laying worker.

Now, it would be just like you to think—even if you don't say—"But how about that flat capping in the case of my own laying workers?" Well, if you don't mind, let's go back and look over your story. In the first place, although you raise no question about it, it is interesting to note that you report a prime swarm June 13, and an afterswarm June 15. Only two days between the prime swarm and the first afterswarm, although the rule is that the first afterswarm comes about 8 days after the prime swarm. It may happen, however, that when the first queen-cell is sealed, at which time the prime swarm issues generally, the weather may be bad, so as to delay the issuing of the prime swarm a day or more, thus lessening the time between the prime swarm and the first afterswarm. But to have the weather so bad continuously as to delay the issuing of the prime swarm 6 days is something unusual, and I feel inclined to account for the closeness of those two swarms in another way. Here's what may have happened: About June 5 a prime swarm issued without being observed by you, and the queen was in some way lost. Such things happen.

The swarm, being queenless, returned to the hive. June 13 the first afterswarm issued, and June 15 the second afterswarm. All of which is merely by the way.

(We come now to the nucleus charged with having laying workers. Pardon me if I say I don't believe there were any laying workers in the case, but a laying queen. You say you did not find a queen. That proves nothing. Queens are not always found, even when we are sure they are present. "But the drone-brood?" Well, it often happens that a young queen seems not to get the hang of properly laying for some time, and a large part, or all, of her brood, is drone brood, and later she performs all right. Sometimes, also it happens that a young queen lays mostly drone eggs, and continues to do so as long as she lives.

You want to know how bees differentiate between the two kinds of eggs when both are laid in worker-cells. That's easy, at least if guesses are allowed. The drone-larva is so much larger than the worker-larva that the bees are obliged to build a canopy over it if they cover it at all.

You might send on, say about a dozen, of the 101 questions you have on hand. Maybe I can match most of them by drawing on the pigeon-hole labeled "I don't know."

UNITED STATES DEPARTMENT OF AGRICULTURE Bureau of Markets

Honey arrivals since last report:

Medina, O.—Alabama 1133 lbs., Mississippi 26,917 lbs., North Carolina 15,665 lbs., Florida 11,284 lbs.

Shipping point information, August 14:

Los Angeles, Calif.—Supplies cleaning up. Demand active, firm feeling. Cash to producer on farm—Extracted: White, 21½-23c; light amber, 20½-21½c; amber, a few sales at 15-18c per lb. Comb honey: \$6-6.50 per case. Beeswax: 34-36c per lb.

San Francisco, Cal.—Shipments liberal. Demand and movement good, steady feeling. Wagon loads track side—Extracted: per lb., water white, 22-23c; sage white, 21-22½c; Alfalfa white, 20-21c; light amber, 19-20c; dark amber, 15-16c. Beeswax, 33-35c per lb.

Caldwell, Idaho—(unofficial) — No sales. Inquiry steady. Crop not made yet.

Yakima, Wash. (unofficial)—Shipments light. Growers holding for higher prices. Few sales reported. Cash to producers: Alfalfa white, in 5-gal. cans, 22½c per lb.

Portland, Ore., Aug. 14.—Demand active, strong feeling, some growers holding for higher prices. Cash to producers—Extracted: Amber, 15-18c per lb.; light amber, 17-21c; white, 20-24c. Comb honey: \$4.75-5.25 per case. Sales to manufacturers: Amber, 18c per lb.; light, 22c; white, 25c. Sales direct to retailers—Extracted: Water white alfalfa, 5-gal. jackets, 27c per lb.; 2-gal jackets, 29c per lb.

Spokane—Receipts very light. Sales direct to retailers—Yakima district: Alfalfa white, in 5-gal. cans, 25c per lb.

Cincinnati—1,700 lbs Florida, 988 lbs. Kentucky, 3,510 lbs. Alabama arrived. Supplies very light. Demand

and movement slow, market firm, few sales. Sales to jobbers—Extracted: California, white orange, 25-26c per lb. Beeswax: Demand and movement slow, market steady, few sales. Average yellow, 37-40c per lb.

Denver—Approximately 100,000 lbs. extracted, 1,399 cases comb arrived. Demand and movement good, firm feeling. Quality and condition generally good. Sales to jobbers—Comb, 24-section cases, No. 1 white, \$6.50; No. 2, \$6. Extracted: White to light amber, 23-25c per lb.

Kansas City—14,200 packages by express and approximately 750 lbs. extracted by freight arrived. Receipts very light. Demand poor, movement limited, weak feeling. Sales to jobbers—Comb: Native Missouri, quality and condition generally good, 24-section flat cases, light, \$6.50-7.50. Extracted, quality and condition generally good, 18-23c per lb. Beeswax: Receipts very light. Supplies light. Demand light, movement limited, firm feeling. Sales to jobbers, 35-38c per lb.

New York—317 bbls. and 25 tierces Porto Rico, 1 car California. Receipts moderate, demand light, movement slow, market firm. Sales to jobbers—Extracted, per gal., Porto Rican, \$2.35-2.45, mostly \$2.40; California, light amber, \$3.00-3.12; white, \$3.20-3.25. Beeswax: Arrivals 178 bags West Indies; 4 bbls., 8 boxes, 19 bales, 6 bags Porto Rico; 42 bags Cuba. Receipts increasing. Demand and movement good; market firm. Per pound, yellow, 43-44c; dark, 42-43c; some poorer as low as 37c.

St. Louis — No arrivals. Supplies light. Too few sales to establish market.

Chicago — Supplies light. Demand and movement moderate. Sales to jobbers—Extracted: White, 23-24c; amber, 21-22c per lb. Comb, No. 1, 27-28c per lb. Beeswax: Prime 33-38c per lb.

Minneapolis — Minnesota receipts very light. Supplies cleaned up. Very few sales. Sales direct to retailers—Comb honey: 24-section cases, \$6.50. Extracted: No supplies.

Philadelphia, Aug. 16.—Arrivals: 7,000 lbs. New York, 4,000 lbs. New Jersey, 1 car California, 3,000 lbs. Pennsylvania, 90,000 lbs. Florida. Sales principally to soft drink dealers; New York, Pennsylvania, New Jersey, 5-gal. cans extracted, 20-22c, mostly 20c per lb.; Florida and domestic, 22c; California bulk, 22½c per lb.

St. Paul—Minnesota receipts very light. Supplies cleaned up. Very few sales. Sales direct to retailers—Comb honey; 24-section cases, \$6.50. Extracted: No supplies.

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FOR SALE—Golden Italian queens that produce good honey gatherers; no foulbrood. Select tested, \$1.25; tested, \$1; untested, 75c; 6, \$4.25; 12, \$8. No bees for sale. D. T. Gaster, Rt. 2, Randleman, N. C.

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FOR SALE—Northern Bred Italian Queens; hardy, prolific goldens, each, \$1; six, \$5. Allen R. Simmons, Claverack, N. Y.

FOR SALE—Three-banded Italian queens; untested, one, \$1; six, \$5; twelve, \$9. Tested queens, \$1.50 each. Rob't B. Spicer, Wharton, N. J.

GOLDENS that are true to name. Untested queens, \$1; 6, \$5; 12, \$9; 50, \$35; 100, \$67.50. Garden City Apiaries, San Jose, Calif.

THREE-BANDED ITALIANS ONLY—Untested queens, each \$1; 6, \$5; 12, \$9; 50, \$35; 100, \$67.50. H. G. Dunn, The Willows, San Jose, Calif.

FOR SALE—Pure Italian queens; goldens that are golden, and Doolittle's choice stock. Select untested (laying queens), 1, \$1; 6, \$5. tested, \$1.50; best breeders, \$5. For large lots write for prices. Pure mating, safe arrival and satisfaction I guarantee. J. E. Wing, 155 Schiele Ave., San Jose, Calif.

SWARTS GOLDEN QUEENS produce golden bees of the highest qualities; satisfaction guaranteed. Mated \$1. 6 for \$5; tested \$2. D. L. Swarts, Lancaster, O., Rt. 2.

GOLDEN ITALIAN QUEENS—No better honey gatherers anywhere at any price. Untested, \$1; tested, \$2. Wallace R. Beaver, Lincoln, Ill.

GOLDEN QUEENS that produce Golden workers of the brightest kind. I will challenge the world on my Goldens and their honey-getting qualities. Price, \$1 each; tested, \$2; breeders, \$5 and \$10. 2A1f J. B. Brockwell, Barnetts, Va.

QUEENS—H. D. Murry's strain of 3-banded Italians; reared by the Doolittle method. Prices untested, 1 for \$1, 6 for \$5, 12 for \$9. No disease. Safe arrival and satisfaction guaranteed. O. D. Rivers, Route 4, Honey Grove, Texas.

FOR SALE—Colonies of extra fine strain Italian bees, with select tested queens, in new 1-story 8-frame single wall-hives, standard full-depth, self-spaced Hoffman frames, \$10 each, f. o. b. here. The bees are free from disease. Wilmer Clarke, Earlville, Madison Co., N.Y.

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THREE-Banded and Golden Italian Queens and pound packages from the Sunny Southland. Grant Anderson, Rio Hondo, Texas.

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WANTED—Would like A No. 1 extracted and comb honey at once. Write to Emil Strudel, 1393 12th St. Milwaukee, Wis.

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[The WORLD is Our Market]

Crop Report and Market Condition

For our September number we asked reporters to let us know how the crop compared to last year, and about what amount would be secured per colony. Also if they had sold their honey and at what price, and what offers were being made by buyers.

THE CROP

We are likely safe in saying that the crop will not measure up to that of last year, and last year's crop was hardly up to the average.

In the New England States there will be about half as much as last year, and the extreme losses during last winter will need another year to be recuperated.

New York has half a crop, or about the same as last year, possibly a little better. Some sections report much better, but the average is about as stated above.

Ohio claims a fine crop—much better than last year.

Illinois is probably a little better than in 1917, since the 1917 crop was a failure.

Indiana has little, Missouri is poor, as is Kansas, and most of Iowa has had a crop failure, the western portion being the exception. This is the region where sweet clover plays such an important part.

Michigan will hardly have half a crop, the State over. But in the northern peninsula there has been a very good crop and the new beekeepers there are enthused.

Wisconsin has had an absolute failure. It is reasonably certain that much sugar will have to be fed to bring the bees through the winter in any shape.

Most of Minnesota reports a failure, the biggest apiarist there stating that he may possibly get 20 pounds per colony.

The sweet clover part of the Dakotas and Nebraska will have more honey than last year, and the same is true of Oklahoma.

The South has a fair crop, though Georgia and Florida can hardly keep up to the 1917 crop, which was unusually large. Kentucky and Tennessee are probably a little above a year ago.

The Colorado average is probably up to last year, though one large association there claims only about a half crop. Some few claim more honey than in 1917.

Texas has had another hard year, but better even at that than 1917, when there was little honey.

In Idaho the crop is in excess of 1917, as it is also in Wyoming and Utah. Montana will have about the same as a year ago. In Washington the crop will hardly be up to average.

Reports from California are conflicting, but a majority of them report from two-thirds to three-fourths of last year, while some claim failure and a few state they think that the crop will about equal 1917.

HAVE LOSSES BEEN MADE UP?

It is very doubtful if we have as many bees yet as we had at the beginning of the 1917 season. Many beekeepers have put forth every effort to get their colonies

strengthened and have made divisions at least to cover all combs, but there are many of these divides that will have to be united to go through the winter, owing to the failure of the honey crop which would have helped made them strong colonies.

In our own yards, it is remarkable the amount of stores the bees have used up since the slow and small clover flow of spring. In preparing to move several yards into the lowlands of the Mississippi in the hopes of their filling up for winter, we found little danger of overloading the trucks with heavy colonies. Much honey has been consumed in the last month.

HONEY PRICES

Very few prices are being suggested at a basis lower than 20 cents f. o. b. producer's point for extracted. The majority of offers in carlots by buyers range between 20 cents and 22½ cents f. o. b. shipping point, put up in 5-gallon cans. One or two offers have been made f. o. b. California points as high as 23 cents, but we believe these to be the exception.

Comb honey is being offered at from \$5.50 to \$6.50 per case. f. o. b. shipping point, but relatively little of this has been sold, most buyers not being ready for the market, and waiting to see where the price will stabilize.

PRICES EXPECTED

Most beekeepers will be satisfied with a price of 25 cents for extracted honey, at least none have shown an attitude of holding for more than this, while many have sold their honey in the neighborhood of 20 cents, net.

One Wyoming beekeeper, who has 80,000 pounds of extracted and 70,000 pounds of comb, expects to get 25 cents and \$6.50 per case. A fair return for 1918, at least.

WHERE WILL PRICES GO?

It is hard to tell where prices will go on honey. Will they get up to 30 cents wholesale, as some seem to expect?

The demand by trades which must resort to other sweets besides sugar, such as fountains, ice-cream manufacturers, soda water men, etc., has helped stimulate the demand.

The foreign demand is still good, also.

The beekeeper who is profiting by these prices and selling his honey in car lots must remember, however, that when the time of stabilization comes he may be glad to have his home markets to fall upon, and that he should keep them supplied if possible now, goes without saying.

A recent letter from Australia states that there is one consignment of honey lying in port there of 400 tons, unable to move owing to the lack of ships. This is only one, probably, of many in different ports of the world. When shipping does become easier, this competition is bound to have its effect on our own prices here. When this will come it is hard to tell.

KEEP INFORMED ON TEXAS CONDITIONS

The **Beekeepers' Item**, a monthly paper edited by Mr. Louis H. Scholl, well known to our older readers, and an authority, has many interesting items which should interest beekeepers, not only in the Southwest, but throughout our country.

In order to allow you to become acquainted with this paper, we offer a special combination of **Beekeepers' Item** one year with **American Bee Journal** for only \$1.25.

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Texas Queens

No more bees in packages, but queens galore from June 1 to October 1. Untested, 75c each, \$8 per doz.; tested, \$1.25 each, \$12 per doz. I have the Three-banded Italians and Golden Italians; very choice stock.

GRANT ANDERSON,
Rio Hondo, Texas.

Weis Fibre Containers FOR EXTRACTED HONEY

Neat, clean, leak-proof, and inexpensive. Especially adapted for home market.

Send for prices. Samples, postpaid, 15c in stamps.

M. H. HUNT & SON, Agents
LANSING, MICHIGAN

Don't stop advertising. because honey is high. Make it more in demand, so the price will stay where it is. Little stickers on your letters, papers, etc., will help. Printed as below in bright red.



Price of 1,000 gummed, 35c.
American Bee Journal, Hamilton, Illinois

Bee Primer for the prospective beekeeper or beginner. A 24-page pamphlet, finely gotten up, with illustrations. It gives a general outline of bees and beekeeping such as desired by the amateur. Two pages are devoted to instructions to beginners. Price, postpaid, 15 cents, or sent free with a year's subscription to **American Bee Journal** at \$1.00.

Attention Eastern Beekeepers

WE HAVE A COMPLETE STOCK OF

Lewis Beeware and Dadant Foundation

We are located on a main line of the New York Central and the West Shore, as well as branches of the Pennsylvania and Erie Railroads; also the Rochester & Syracuse Electric Line, which assures prompt delivery. Parcel Post orders receive prompt attention.

Five and ten-pound pails, also five-gallon cans and glass jars.

Queens, three-banded and Golden Italian, ready for delivery now. Untested, \$1 each; 6 for \$5.50; 12 for \$10; tested, \$2; 6 for \$10.

Safe delivery guaranteed, dead queens being replaced upon their return.

THE DERROY TAYLOR CO.
Newark, New York

Golden Italian Queens

RUSTBURG, VA., R. No. 3, March 18, 1918.

Mr. Ben G. Davis:

Dear Sir—Please find enclosed \$5, for which please send me the very best Golden Queen you can for the money. If you can't ship her at once, please notify me. I ordered one from you 3 years ago last fall that was the best I ever saw. Her bees stored 320 pounds of comb honey the first year. I have several of her daughters that are fine.

Hoping to get a good one again, I am yours truly,

J. W. LAWRENCE.

PRICES OF QUEENS

	Nov. 1 to May 1			May 1 to June 1			June 1 to Nov. 1		
	1	6	12	1	6	12	1	6	12
Untested	\$1.50	\$ 7.50	\$13.50	\$1.25	\$ 6.50	\$11.50	\$1.00	\$ 5.00	\$ 9.00
Select Untested	2.00	8.50	15.00	1.50	7.50	13.50	1.25	6.50	12.00
Tested	2.50	13.50	25.00	2.00	10.50	18.50	1.75	9.00	17.00
Select Tested	3.00	16.50	30.00	2.75	15.00	27.00	2.50	18.50	25.00

No Nuclei or Bees by Pound.

Safe arrival, purity of mating and satisfaction guaranteed.

Queens for export will be carefully packed in long distance cages, but safe delivery not guaranteed.

BEN G. DAVIS : : Spring Hill, Tenn.

Read "THE BEEKEEPER"

The only Canadian bee publication. Keeps beekeepers closely in touch with Apicultural conditions in Canada. It is the official organ of the Beekeepers' Associations for the three provinces—Ontario, Manitoba and New Brunswick.

Beekeeping and horticulture are effectively combined to make a live, attractive and practical publication.

Price, postpaid, \$1 per year.

United States, \$1.25.

Foreign, \$1.50

Send for a free sample copy.

The Horticultural Publishing Co., Ltd., Peterboro, Ontario

QUEENS Hardy, Long Lived and Disease Resisting QUEENS

Twenty-Two Years of Select Breeding Gives Us Queens of Highest Quality -- Queens for Honey Production -- Queens of Unusual Vitality

"There are few Queens their equal and none better"

WHAT BEES DO, HEADED BY OUR QUEENS

"One swarm made 185 sections of honey and another 296 sections. I am well pleased."—MELVIN WYSONG, Kimmell, Ind.
 "Your bees averaged 150 pounds of surplus honey each. I find them not only hustlers, but gentle."—FRED H. MAY, Meredosia, Ill.
 "I have tried queens from several different places and like yours best of all."—C. O. BOARD, Alabama, N. Y.
 "We are only one mile from Lake Erie and exposed to high, cold winds; in fact, this is the windiest place along the great lakes. Your bees were able to stand the winter with only an insignificant loss, and we would have no others. As for honey, they averaged 175 pounds of extracted surplus, did not swarm, and gave an artificial increase of 30 per cent, which is as fine a record as can be had in this locality, especially when the work is done entirely by amateurs." Name furnished on request. North East, Pa.

Price List of Our Golden and Three-Banded Italian Queens

Untested	\$.75; 25 or more, \$.60 each	Select untested	\$.90; 25 or more, \$.75 each
Tested	1.50; 25 or more, 1.25 each	Select tested	1.75; 25 or more, 1.60 each
Virgins			30c each

We guarantee safe arrival of all Queens, that they are very resistant to European foulbrood, and, in fact, will give complete satisfaction. Wings clipped free of charge. Our capacity is 2,000 Queens monthly.

M. C. BERRY & COMPANY, Hayneville, Alabama, U. S. A.

Mr. Beekeeper:

Increase your honey crop by giving the bees all the super room that they can fill.

We will help you by furnishing you with fixtures ready for use, at the lowest prices.

Hives and supers, nailed and painted; frames, wired and filled with full sheets of foundation; sections, filled with foundation, can be shipped on short notice.

The LEWIS LINE is in the lead with the live honey producers.

WESTERN HONEY PRODUCERS

**Wholesale and Retail Distributors
SIOUX CITY, IOWA**

That Good Queen

in your colony that is two years old. Are you going to try her another year? Are you going to gamble on your next spring's crop? Probably she has kept your colony booming for two years. If she hasn't you don't want her. If she has **Don't** keep her. **Why?** Because she has "exhausted herself." She is no longer a young queen. Next spring she will fail you. Your colony will be weak. And in the spring rush the flow will be over before you can get another. Don't risk your 1919 crop for the sake of 75c. Why not requeen this fall with

Forehand's Three-Bands

THE THRIFTY KIND

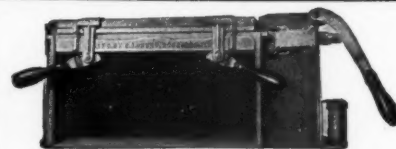
and be sure of your next spring crop. Over a quarter of a century of select breeding brings them up to a standard **Surpassed by None but Superior to Many.** We guarantee pure mating, safe arrival, and perfect satisfaction.

	1	6	12
Untested	\$.75	\$4.25	\$8.00
Select Untested	1.00	5.00	9.00
Tested	1.50	8.75	17.00
Select Tested	2.00	11.00	20.00

Write for circular

W. J. FOREHAND & SONS

Fort Deposit, Alabama



PAT. APPLIED FOR

C. O. BRUNO NAILING DEVICE

Made for the Huffman Brood Frames. A combined Nailing, Wiring and Wedge Clamping Device. Does the work in half the time. Has been tried and is guaranteed to do accurate work. Makes the frames ready in one handling. Price \$6.50.

Complete directions for operating are furnished with each device.

Manufactured by C. O. BRUNO
1413 South West Street, Rockford, Illinois

MOTT'S NORTHERN-BRED ITALIAN QUEENS

that resist disease well. Those that resist disease must be hardy, prolific, and hustlers; they are gentle. Bees per pound. Plans on "How to Introduce Queens and Increase," 25 cents. List free. Untested \$1 each.

E. E. MOTT, Glenwood, Mich.

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We carry a complete stock of supplies at all times, and can make prompt shipments. Our prices will interest you.

A trial order will convince you that our prices and goods are right. Send us your inquiries.

A. H. RUSCH & SON CO.
Reedsville, Wis.

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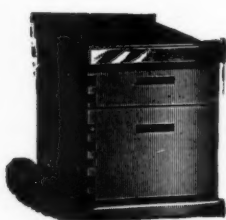
BEEKEEPERS

We manufacture millions of sections every year that are as good as the best. The **cheapest** for the **quality**; **best** for the price. If you buy them once, you will buy again.

We also manufacture hives, brood-frames, section holders and shipping cases.

Our Catalog is free for the asking

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Thirty years' experience in making everything for the beekeeper. A large factory specially equipped for the purpose ensures goods of highest quality. Write for our illustrated catalog today.

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Bee Keepers' Supply Mfg. Plant.

A BIG STOCK OF BEE SUPPLIES

ALL BOXED, ready to ship at once—thousands of Hoffman Frames; also Jumbo and Shallow Frames

of all kinds—100 and 200 in a box. Big stock of Sections and fine polished Dovetailed Hives and Supers.

I can give you bargains. Send for a new price list. *I can save you money.*

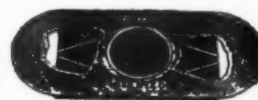
Will take your Beeswax in trade at highest market price.

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SAVES
HONEY
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MONEY**

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Comb Honey Shipping Cases

Our shipping cases are all accurately made of nice basswood lumber. This makes a very attractive, neat and strong package.

Send for our Catalogue.

**AUGUST LOTZ COMPANY
BOYD, WISCONSIN**

QUEENS--1918--QUEENS

Goldens only, untested; \$1 each, six for \$5. Ready for delivery after April 10th. Safe arrival and perfect satisfaction guaranteed.

R. O. COX

R. F. D. No. 4, Greenville, Alabama

Archdekin's Fine Italian Queens and Pound Packages

Untested queens, 75c each, 6 for \$4.25; doz. \$8.00 select tested, \$1.25.

Package bees, \$1.60 per pound. Packages with queen, 1 pound and queen, \$2.35; 2 pounds and queen, \$3.35; 3 pounds and queen, \$4.35.

My package is best and lightest in use. Saves bees and express. Satisfaction guaranteed, but bees in transit more than 5 days are sent at customer's risk. No disease.

**J. F. ARCHDEKIN,
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BEE SUPPLIES

Let Us Figure With You

We know we can satisfy you on price and \$8.00; select tested, \$1.25.

**C. C. Clemons Bee Supply Co.
Dept. S., Kansas City, Missouri**

BARNES' Foot-Power Machinery



Read what J. I. Parent, of Chariton, N. Y., says: "We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work. This winter we have a double amount of hives, etc., to make with this saw. It will do all you say of it." Catalog and price list free.

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WINDMILL POWER printed "Gleanings in Bee Culture" forty-five years ago. Now an up-to-date plant with every facility does this work. This plant is at your service. Whether you want books, booklets, circulars, stationery, labels, tags, cartons, tickets or tree-labels, this plant is equipped to do your work promptly and well.

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"I have been a Cypress man for lo, these many moons. Almost all my dovetail hives are of Cypress, as are bottom-boards, and I think, shallow telescope covers. My hive stands are of Cypress, and stand in the mud and wet all the time and are as solid as when I got the first one some years ago. Cypress is a trifle heavier than white (cork) pine, but not much more than the heavier grade of pine now used. The fact that it is 'everlasting' compensates for all this."

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For a job of repairing or for equipment, the lumber that will give you the greatest real investment value in the market is Cypress, commonly known as the "Wood Eternal." This wood does not rot down like most woods; it lasts and lasts and LASTS, and LASTS and LASTS. It is the Gopher Wood of the Bible—Noah built his ark of Cypress. Since the days of Noah, Cypress has been famous for endurance under the most trying conditions. **Cypress is the one certified Greenhouse wood. That's "some" test. Bottom-boards are another.**

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There are 42 volumes in the internationally famous Cypress Pocket Library, and each is authoritative in its field, and all are FREE. Vol. 1 is the U. S. Gov't Report on Cypress—that is a good authority, surely. Vol. 4 is the Barn Book, with plans and specifications for building. Vol. 36 is the Carpentry Book, making easy a dozen hard jobs of carpentry. Vol. 19 is the Canoe and Boat Book. Vol. 37 is the Silo Book. All are, free for the asking. Suppose you ask for one or a dozen, right away.

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